Regional Review of Social Safety Net Approaches

in Support of Energy-Sector Reform

Appendix 6:

Energy Reform and Social Protection in Romania

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Table of Contents

Acronyms and Terms

AEE	Association of Energy Engineers
ANRE	The regulatory authority for electricity and heat
ANRGN	The regulatory authority for natural gas
ANRSC	The regulatory authority for communal services
APER	Romanian Energy Policy Association
ARCE	Romanian Energy Conservation Agency
ASE	Alliance to Save Energy
BCM	Billions of cubic meters
CFL	Compact fluorescent lamp
CHF	The Cooperative Housing Foundation
CHP	Combined heat and power
CM	Cubic meter
DEA	Danish Energy Agency (now the Danish Energy Authority)
DH	District Heating
DSM	Demand-side management
EBRD	European Bank for Reconstruction and Development
ECFS	Energy conservation funding scheme
EIB	European Investment Bank
ERM	Environmental Resources Management
ESCO	Energy Service Company
FCA	Foundation for Civic Action
FREE	The Romanian Energy Efficiency Fund
Gcal	Gigacalorie
GDP	Gross Domestic Product
GEF	The Global Environment Facility
GOR	Government of Romania
GWh	Gigawatt hour
HAP	Heat Assistance Payments
HCA	Heat cost allocator
HGR	Government Decision (Romanian initials - sometimes appears as HG)
IFC	International Finance Corporation
IMF	International Monetary Fund
IPCT	Romanian Institute of Building Design, Research and Technology
ISTI	International Science and Technology Institute
Kg	Kilogram
KWh	Kilowatt hour
LRP	Local Reference Price
MROL	Millions of ROL
MTPW&H	Ministry of Transport, Public Works and Housing
MUNEE	The Municipal Energy Efficiency Network
MW	Megawatt
NRP	National Reference Price
OA	Owners' Association
OPIC	Overseas Private Investment Corporation

OUG	Government Decision
RADET	Bucharest district heating utility
REEN	Romanian Energy Efficiency Network – an informal group run by APER
RFPA	Romanian Federation of Property Owners
ROL	Romanian ROL (currency)
SAR	Romanian Academic Society
SFDES	Special Fund for Development of the Energy Sector
Tariff CA	Standard tariff
Tariff CA2	Two-time zone tariff
Tariff CA3	Three-time zone tariff
Tariff CD	Straight commodity charge tariff
Tariff CS	Social tariff
TJ	Terajoules
TRV	Thermostatic radiator valve
UNDP	United Nations Development Programme
VAT	Value Added Tax (European sales tax)
WEC	World Energy Council

Preface

This report is one of five country reports and a synthesis report prepared under the USAID-sponsored project *Regional Review of Social Safety Net Approaches in Support of Energy-Sector Reform*, described below:

Abstract

The energy sector reform process is occurring throughout the transition countries of Central and Eastern Europe (CEE) and Eurasia. The United States Agency for International Development (USAID) has supported this process in numerous countries. The electricity sector reform process involves establishing a modern legal and regulatory framework, unbundling the monopoly electric utility into separate generation, transmission and distribution companies, and creating a competitive electricity market and privatization. This process is leading to the introduction of transparent commercial operations, modern technology, and investment that is needed to provide reliable and economic service for the long run. The transition to this end goal includes increasing tariffs and the collection enforcement for the supplied electricity.

During the transition there will be some impact on vulnerable populations. To identify approaches that will ease the impact on these populations, a multi-country study was conducted to identify social safety net approaches in support of energy-sector reform. This report documents this activity's results. The study identifies and documents lessons learned and best practices to ease the transition impact of power sector reform.

The three approaches to helping low-income households afford energy are contrasted and compared. The approaches are: 1) subsidies and assistance payments; 2) energy-efficiency mechanisms; and 3) tariffs. Each mechanism's impact is analyzed using a matrix that compares a range of quantifiable evaluation criteria.

The country reports (appendices) review the mechanisms that Armenia, Bulgaria, Hungary, Kazakhstan and Romania have used.

The results are available for government policymakers, international financial institutions, donors, and others interested in power sector reform and addressing the needs of vulnerable populations.

The work was sponsored by USAID and carried out by contractors Aguirre International and the International Science and Technology Institute, Inc. (ISTI). The author gratefully acknowledges the input of USAID, the other team members, and the many individuals and institutions, both in Romania and in the United States, who contributed information, time and expertise. Any omissions or errors are, of course, my own.

Executive Summary

Although the Romanian power sector is dominated by state-owned companies, privatization is on the horizon for both electricity and natural gas. There are no plans to privatize district heating, but concession agreements and management contracts are beginning to take hold. Until 2002, the fortunes of the electricity and district heating sectors were mutually dependent through Termoelectrica's dominant position as the largest supplier of both heat and power. Some of the company's assets passed into municipal ownership during 2002, but Termoelectrica remains a major supplier of heat and power. This is significant for the purposes of this study because heat, rather than electricity, represents the largest financial burden to low-income energy consumers. Electricity fuels only about one percent of residential heating.

Romania has no official declared poverty line; however, if that line were set at $2/person/day, 40 percent of Romanian households lived below the poverty line in 2002, rising from 22 percent in 1997, when the policy of raising energy prices commenced.

In preparation for privatization, the government is making determined efforts to raise energy prices to market levels. Household electricity prices have risen from less than $0.01/kilowatt hour (kWh) in 1991 to almost $0.06/kWh in 2002, and are now at cost-recovery levels; thus, the only barrier to privatization is a poor rate of collection in the industrial sector.

Household natural-gas prices are being raised more slowly, increasing from less than $40/thousand cubic meters in 1991, to more than $80/thousand cubic meters in 2002. Indigenous natural gas is so cheap that the International Monetary Fund (IMF) considers gas prices to represent an implicit subsidy of over $1 billion per year. Gas companies are profitable, the household market is large, and the scope for increasing prices is high; thus, privatization of the gas companies should be straightforward, as they are very attractive assets.

District heating prices rose from around $10/gigacalorie (Gcal) in 1991 to almost $24/Gcal in 2002. That sector is loss-making, some networks are poorly managed, the sector requires substantial reform, and privatization is not on the political agenda.

Low-income households do not use electricity for heating and own few electrical appliances; some do not even use a refrigerator. Forty-four percent of households, including low-income households, subscribe to an inverted block tariff that reduces typical monthly power bills from $4.60 to $2.17. That subsidized tariff costs the power company $64 million per year, funded by a cross-subsidy within the household electricity sector.

Households using natural gas benefit from artificially low prices, and are responding to this incorrect price signal by disconnecting from centralized heating systems in favor of cheap natural gas. A targeted inverted block tariff for natural gas established in 2002 (costing $40 million per year) further lowers the natural gas bill for eligible households by an average of $59.20/year, or $4.93/month.

The Romanian Government does not compensate power and gas distributors for operating “social tariffs,” so these are examples of the government passing the costs of its social protection programs to the energy utilities.

Winter heating represents the largest financial burden to low-income households. This burden is offset by a range of explicit and implicit energy subsidies and assistance payments. Increasingly well-targeted Heat Assistance Payments (HAP) cost $32 million in 2002. HAP is paid direct to the appropriate utility on the behalf of specific low-income consumers or, in the case of households heating with solid fuels, in cash. District heating companies with particularly high operating costs also receive direct government subsidies ($145 million for 2002), enabling them to lower prices to the level of a single tariff payable by all households, known as the National Reference Price (NRP).

Despite the availability of subsidies, heating costs are unaffordable for some low-income households, particularly those with heating bills above the level for which the subsidies are designed. There are even cases in which heating bills exceed total household income. Higher-income (but still low-income) households with an average income per person of more than $63.18/month do not qualify for Heat Assistance Payments at all and must pay the full district heating bill — typically $60 per winter month during the winter of 2002/2003 — which is generally considered to be unaffordable, as the national average net income in 2002 was only $110/month.

Although all low-income households would be motivated to reduce their heating costs, this is usually technically impossible for those living in centrally heated buildings, which are rarely fitted with individual metering and control systems. The only practical way to reduce the heat bill is to disconnect from the system (or simply refuse to pay), freeing the vast majority of household income for other things.

Electricity is universally metered. Natural gas is metered at the household level if used for cooking and heating, or at the building level if gas is used for cooking only. Nonpayment and theft are not tolerated, and households respond to the threat of disconnection by reducing their consumption levels and paying their bills. There is growing awareness of the benefits of compact fluorescent lamps (CFLs), and the energy efficiency of appliances has improved substantially as a result of EU energy-efficiency labeling initiatives. Although households heating with individual gas boilers weatherize to keep costs down, weatherization is not a solution to the problem of nonaffordability of centralized heating. The absence of household-level metering and control removes the incentive to invest in energy efficiency, as it brings no economic benefit to the household. Thus, a household that weatherizes, reduces temperature levels, and turns off radiators, pays the same heat bill as the neighbor who does nothing. Although the government is now taking some steps to improve the incidence of household-level metering to address this problem, the effort seems to be making little impact.

District heating companies are generally being run according to an unsustainable business model, where the systems were designed to provide heat to a low temperature in every room in every apartment throughout the winter, whether or not the rooms are occupied. Although customers were prepared to accept this service when prices were

low, now that prices are rising households want to pay to heat only rooms that are occupied and to heat them to an appropriate temperature. Low-cost, proven technologies could enable the heat companies to supply heat on a “pay for what you use” basis (e.g., basement meters, heat cost allocators, thermostatic radiator valves), but the companies cling to the view that customers should pay for whatever the companies choose to provide. Not surprisingly, households are disconnecting and are doing so at an alarming rate. Low-income households that disconnect for affordability reasons sometimes choose to continue heating a single room; other low-income households disconnect completely and install simple gas stoves; and richer households install gas central heating.

The district heating sector is now in a state of crisis. During the winters of 2000/01 and 2001/02, roughly 28 percent of the networks (72 out of 251) collapsed as a result of endemic nonpayment and disconnection. The crisis is a direct result of government attempts (acting on the advice of the IMF) to raise prices and is exacerbated by a *laissez faire* approach to policymaking in such issues as metering, zoning, and payment enforcement.

The collapse of the district heat companies has forced households to find another heating solution quickly. Low-income households, which cannot afford individual central heating systems, typically resort to using wood-burning stoves in apartment buildings, which carry health and safety risks but are affordable.

Thus far, there have been no projects focusing specifically on energy issues for low-income households. Moreover, household weatherization is not on the political agenda; no government department is responsible specifically for low-income energy issues; there is no formal definition of “fuel poverty” and no fuel-poverty-eradication strategy; and the energy-efficiency agency is under funded and subordinate to the industry ministry, with a mainly advisory role in other sectors.

These issues are examined in detail in the body of this report, which concludes with a series of reforms that Romania could consider relative to subsidies and assistance payments, energy efficiency, and tariff mechanisms within the overall context of strengthening its social safety net.

Chapter 1
Background: Energy-Sector Reform and Privatization

A. Introduction

This report documents social safety net approaches used in Romania's energy sector — specifically, subsidies/assistance payments, energy efficiency, and tariff mechanisms — within the context of that particular sector's reform. One of five country appendices to a more general synthesis report comparing approaches in Central and Eastern Europe and Eurasia, the report presents recommendations based upon comparison of approaches used in Romania with best practice in the region.

Research included an in-country mission by Mark Velody and Michael Philips during April 2002, follow-up research in Romania by Virgil Roman, and desktop research during summer and autumn of 2002. The resulting report was partially updated during the spring of 2003 to include aspects of the (cold) winter of 2002/2003, submitted to a select group of Peer Reviewers for observations, and finalized during the summer of 2003[1].

B. Ownership and Characteristics of the Electricity Sector

Although the Romanian power sector is dominated by state-owned companies, privatization looms on the horizon: first for the distribution sector and later for generation. The national distribution company, Electrica, has been split into eight parts, which will form the basis of future independent power-distribution companies.

1. Privatization of Power-Distribution Companies

The European Union (EU) funded a pre-privatization study for two of the eight distribution zones (Timisoara in the West and Dobrogea in the East). This project was carried out by the French banking group, BNP-Paribas. Although it was envisaged that the companies would be privatized as a result of the work, the privatization did not go forward.

The EU is now planning to fund a new project entitled "Further Electricity Distribution Privatization," which will take place during 2003. According to the Call for Tender, the project aims to assist the preparation of the above two regional distribution companies for privatization, including advising the Ministry of Industry and Resources on negotiations and closing of the privatization transaction. Specific tasks include due-diligence work, a strategy to allow the ministry to make an informed decision on the method of privatization, and the actual privatization transaction. As the duration of the project is 14 months, the first two electricity-distribution companies should be in private ownership by January 2004.

[1] Although statistically it was not a particularly cold winter, it was the first non-mild winter since energy prices started to rise sharply.

The extent of the government's commitment to successful, full privatization is still subject to some uncertainty. According to paragraph 36 of the International Monetary Fund's (IMF) review of Romania [13 August 2002], the Government of Romania (GOR) "agreed to give priority to the full privatization of two electricity distribution companies, instead of limiting private-sector capital injection to 35 percent of equity." However, the official government letter to the IMF, dated August 2, 2002, states [paragraph 24]: "We will instruct the privatization advisor to search for the optimal privatization strategy, with preference being given to selling a majority share of these companies to strategic investors" — wording that may represent a lower commitment to full privatization than that ascribed to it by the IMF.

2. Metering/Collection Company

Until 2002, local meter-reading companies, all working directly under contract to Electrica, read electricity meters and collected household payments at the door. As part of preparation for privatization, a national metering company, Sinserv, was established in 2002. As of 29 March 2002, Electrica entered into a single national contract with Sinserv, which now manages the work of the local companies. It is understood that Sinserv is owned by the trade unions.

3. Privatization of Power Generation

At present, electricity is generated by three state-owned companies:

- **Termoelectrica.** Owns the conventional power and heat plant
- **Hidroelectrica.** Owns the hydro plant
- **Nuclearelectrica.** Owns Cernavoda nuclear power plant

As well as generating power, Termoelectrica provided 63 percent of heat produced in Romania in 2001. This share will be lower in the future following transfer of some of the boiler plants to municipalities in 2002. The company produced 31,460 gigawatt hours, (GWh) of electricity and 107,200 terajoules (TJ) of heat in 2001, which required the operation of only 9,413 megawatts (MW) of its installed capacity of 13,011 MW.

In its capacity as a heat supplier, Termoelectrica is a direct or indirect beneficiary of both the government subsidies for district heating ($150 million for 2002) and Heat Assistance Payments (HAP) scheme. These subsidies are described in detail in this report.

The GOR, with United States Agency for International Development (USAID) support[2], has developed a privatization strategy for power generation. Termoelectrica will be split into four companies with generation assets, and a fifth company that will carry out services, such as fuel purchasing and imports management. The four generation companies are:

- Turceni Group and Rovinari Group, which will own assets in the mining areas

[2] By consultants Hunton and Williams during 2002.

- Deva Group, which will take over assets tied to a World Bank loan
- Bucharest Group, which will own the rest of the assets (some of which are in fact remote from Bucharest)

Turceni Group and Rovinari Group will be scheduled for privatization first, through offers that may or may not include some of the mines around the power stations. The future owners of the thermal plants will be offered an option to buy some or all of 21 partially completed hydroelectric plants.

As the current commercial code for electricity was designed for a situation under which all power-generation assets are state owned, a new code will be developed with USAID assistance.

C. Ownership and Characteristics of the Other Energy Sectors

1. District Heating Sector

Termoelectrica is the main supplier of both heat and power, which is significant for the purposes of this study because district heating, not electricity, represents the largest financial burden to low-income households. The remaining district heating networks that are not supplied by Termoelectrica either generate heat themselves or purchase heat from local industrial complexes.

At the beginning of 2000, there were 251 district heating systems in Romania: 88 of these served municipalities, 132 served towns, and 31 served communes. Because sharp price rises of the last two years have led to mass nonpayment and disconnection by households, 72 of the systems have collapsed so far. A table illustrating the collapse of the networks since 2000 appears as Appendix 1.1.

Households living in buildings formerly served by the collapsed district heating systems are now using primarily wood, natural gas, and kerosene for winter heating.

Of the remaining 179 district heating networks, 34 buy heat from Termoelectrica, 101 generate heat from their own boilers, and 44 are hybrid systems that generate some heat and buy the rest from local industry.

In the spring of 2002, the GOR transferred ownership of 16 Termoelectrica plants to the municipal owners of the heating networks. According to correspondence between the Romanian Government and the IMF, the aim of the transition was to increase local authorities' incentive to improve collection levels and see more-efficient sources of heating supplies. During the winter of 2002/03, the Government continued to subsidize the externalized plants to give the municipalities time to improve their performance.

According to the World Energy Council’s (WEC) Group for Central and Eastern Europe, district heating is the worst-performing energy sub-sector in the region, and Romania’s

district heating situation is the worst of the 11 member countries. WEC's solution to reforming district heating is reproduced as Appendix 1.2[3].

a. Municipal Network Ownership and Concession Agreements

The municipal district heating companies own the network up to and including the meters in the basement (where fitted). Networks typically comprise four-pipe systems of two heating pipes and two hot water pipes; two meters are required for each staircase.[4]

Five or six towns, including Ploiesti and Alba Iulia, have offered concessions to operate their district heating systems, and several mayors have expressed interest in this model. Some interviewees expressed skepticism and concern about this trend, as in Romania municipal concessions can be associated with corruption.

According to the European Bank for Reconstruction and Development (EBRD), concessionaires cannot be required to install heat cost allocator/thermostatic radiator valve (HCA/TRV) bundles as part of the concession agreement because households are not party to the agreements. Recent legislation on Delegated Management (Law 326/2001) provides an as yet untested alternative to the concessions regime.

b. Internal Heat Networks in Buildings

Internal systems of pipes/radiators within Romanian apartment buildings are owned by the households and not considered part of the district heating network.

The legal relationship between the heat companies and the consumer is with the building (owners association), not the individual apartment. When more than one staircase exists, they are billed separately but still through the owners association.

A significant barrier to improving the energy efficiency of district heating networks is that the district heating companies do not normally invest in the demand side, as it is not their responsibility. For example, when district heating companies borrow money for rehabilitation from organizations such as the EBRD, demand-side (apartment level) equipment such as heat cost allocators, thermostatic radiator valves, and weatherization materials cannot be included because the households are not party to the loan. As a consequence, systems are typically rehabilitated to better meet historical household demand levels rather than first taking steps to lower household demand to a level for which the household would be willing to pay market prices.

c. Balancing Systems for Reducing Heating Costs

In a typical district-heated area in Romania, some apartments have too much heat and other apartments too little. Balancing systems for buildings and devices that provide individual autonomous control for apartments (HCA/TRVs) are rare. Thus, efforts to

[3] The "Neptun Declaration" of 10 June 2002, formally adopted by the WEC in October 2002.

[4] Large apartment complexes can have several staircases that may be treated separately for billing purposes, particularly if each staircase is metered separately for water and/or heat.

save energy by reducing heat input to an apartment brings no financial benefit to the household, as the results of such effort are neither recorded nor measured.

In the relatively few cases where heat cost allocators and thermostatic radiator valves are fitted in district heated buildings, the HCA supplier adopts a permanent role, becoming a billing company that takes readings from the HCAs and allocates costs between households.

d. Household Meters

Until 2002, electricity meters in urban areas were read monthly, and customers had the option of either paying at the door or at a payment center. In rural areas, Electrica reads the meter and collects the money every two months. Nationally, around 40 percent of customers paid at the door and 60 percent at payment centers.

An experiment with estimating meter readings every six months was carried out in Bucharest during 2002. Meter readers/payment collectors visited monthly to collect money, but no longer read the meter. The experiment caused considerable confusion among households; according to Electrica, some 90 percent of customer complaints in the capital during the summer of 2002 were about this issue. The removal of the direct contractual link between the local branch of Electrica and the local meter readers as a result of the recent creation of the national meter reading and collection company, Sinserv further added to the confusion. The experiment was unpopular, but it is not yet clear whether this resulted from unfamiliarity, the design, or poor implementation.

The practice of reading meters every six months is incompatible with continuing to run the social tariff, which relies on households monitoring their consumption carefully to keep below the monthly threshold — a practice impractical in the environment of infrequent meter-reading. This issue may become a source of friction between Sinserv, which is understood to want to cut costs by reading meters less frequently, and those stakeholders who wish to retain the social tariff.

e. Privatization of District Heating

Privatization of the heat companies is not on the political agenda, for several reasons. One of these is that there has been little investment in most of the district heating systems in Romania during the last 25 years, with a few notable exceptions that have been or are being financed with multilateral or bilateral assistance. The broad objectives of these investments are as follows:

- ***USAID projects.*** To demonstrate the scope for attracting financing through pre-feasibility studies
- ***IFC projects.*** To demonstrate that commercial projects work
- ***EBRD, EU, and Danish projects.*** To demonstrate the scope for energy efficiency

A Constitutional argument that district heating (DH) companies may not be privatized would probably be circumvented, as it has been in other sectors, if there were political will to privatize.

International Finance Corporation (IFC)-funded demonstration projects in the cities of Cluj and Targoviste have demonstrated that incomes of $100/month are too low to support the costs of the rehabilitating district heating networks. Even if income figures are raised to include the gray and black economies, this principle still holds.

Disconnection and nonpayment are threatening the sustainability of the district heating networks. For example, in the town of Fagarasi, a district heating company rehabilitated its plant and network with an EBRD loan but then lost 50 percent of its customers and is unlikely to continue to service the loan. Experience of recent years suggests that projects have been flawed, as they focused on supply-side investments without first stabilizing the customer base through demand-side investments that allow customers to buy only the heat they need — hence removing the incentive to disconnect.

Honeywell, a U.S. supplier of equipment to the Romanian heating sector, summarized the two major barriers to rehabilitation of the district heating networks as: (a) disconnection/non-payment; and (b) the fact that the companies, and their municipal owners, are not bankable.

The World Bank does not have a specific position on the privatization of district heating in Romania but usually promotes public-private partnerships for district heating.

2. Natural Gas Sector

The downstream natural gas sector, fully owned by the Romanian state, operates two distribution companies: Distrigaz Nord and Distrigaz Sud. These companies cover the north and south of the country respectively.

According to the GOR's memorandum to the IMF of August 2002, a contract for privatization advisors for the two gas companies will be signed by the end of 2002, a privatization strategy will be approved by the end of March 2003, and the announcement of the privatization tender will occur by the end of May 2003.

In August 2002, the EU launched a call for expressions of interest for consultants to assist in preparing for privatization, advising the Ministry of Industry and Resources during negotiations, and transferring of control to the winning bidder. The duration of the contract is 14 months from October 2002, which implies that the companies may be privatized by the beginning of 2004.

Chapter 2
Poverty and the Energy Sector

A. Poverty in Romania

As Romania has no official poverty line, a variety of definitions are used by different actors; the general consensus, however, is that poverty is increasing. According to the World Bank, by 1997 poverty in Romania had increased to five times that recorded in 1989, mainly as a result of contraction of economic activity. By that time, about 22 percent of the population — approximately 5 million individuals and 1.6 million households — were living below the poverty line. In 2001, the World Bank[5] estimated that 30 percent of the population lived below poverty level. Separate studies[6] have also revealed Romania's rising poverty which, using the widely accepted definition of the poverty line as $2/day, in 2002 can be safely estimated at 40 percent.

Poverty alleviation falls within the scope of the Ministry of Labor and Social Protection. Priorities in 2002 target institutionalized young people, young people with children, and the reintegration of former prisoners.

The principle multilateral and bilateral donor organizations all work to help alleviate poverty in Romania, with USAID focusing its social assistance on the health sector and also helping to develop the conditionalities for the World Bank Social Development Fund in 1998. The EU is active, as well, through its RICOP and Economic and Social Cohesion programs. United Nations Development Programme's (UNDP) local office[7] is a useful source of studies and information.

According to the World Bank[8], poverty is widest spread and most profound in rural areas. Forty-five percent of Romania's population lives in rural areas, where subsistence farming is widespread [and the word "peasant" an accepted term bearing no negative connotation].

According to the Social Program for 2002 - 2003, the guaranteed minimum monthly income levels were raised on January 1, 2003, to 740,000 ROL ($22.21) for single person households; 1,328,000 ROL ($39.70) for two-person households; 1,845,000 ROL ($55.17) for three-person households; 2,285,000 ROL ($68.71) for four-person households; and 2,728,000 ROL ($81.56) for five-person households. Five hundred ninety thousand (590,000) persons benefited under this social assistance program.[9]

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[5] Source: Romania at a Glance - www.worldbank.org, 2002.

[6] Wagner et al. 1998, Dinculescu and Chirca; 1999, Chirca and Tesliuc 1999.

[7] www.undp.ro

[8] From Rural Poverty to Rural Development, World Bank 2002, www.worldbank.org.ro

[9] Source: Adevarul Economic, No. 30, 31st - 6th August 2002, announcing the social figures from January 1st 2003.

B. Income Levels

The Romanian Energy Policy Association (APER)[10] provides detailed household income data by deciles for 2001, which is also split into cash income and non-cash income. The data for the four poorest deciles are as follows:

	Average Income	
Deciles	**Per household (of which cash)**	**per person**
Poorest	$92 ($26)	$26
Second poorest	$107 ($48)	$48
Third poorest	$115 ($64)	$64
Fourth poorest	$124 ($77)	$77

Cash income includes salaries, income from own activities, sales, unemployment benefits, pensions, children's allowances, scholarships, income from property, etc; non-cash income includes equivalent value of goods and services received at no cost or discounted, and the equivalent value of consumption from own resource (food and non-food products).

The relatively low proportion of cash in the average income of the poorest deciles reflects the fact that Romania's rural poor grow their own food.

For some 92 percent of persons, average income was lower than the average net salary of $97/month. According to the same report, the average monthly net income had risen to $130/month by March 2003.

C. Energy Consumption in Low-Income Households

1. Power Consumption

According to Electrica, low-income consumers tend to choose the "social tariff" and monitor and control their power consumption very carefully up to the limit of subsidized consumption [60 kilowatt hours (kWh)/month at 1,157 ROL/kWh, or approximately $0.036/kWh]. They do not consume above the limit, as the price at that level rises to a punitive 4,977 ROL/kWh, or $0.155/kWh. Hence, typical monthly electricity costs for low-income consumers (using the social tariff) during April 2002 may be calculated as up to:

1,157 ROL x 60 kWh = 69,420 ROL / 32,000 = $2.17 per month

[10] Source: "The Weight of the Energy Bill in the Low Income Family Budget", Romanian Energy Policy Association, sponsored by USAID and ASE, 2003, which in turn cites GfK, the National Institute for Statistics and the Romanian Government are cited as the original sources.

If the same household had chosen the *standard tariff* of 2,454 ROL/kWh (7.7 US cents/kWh), household electricity costs would have been:

2,454 ROL x 60 kWh = 147,240 ROL / 32,000 = $4.60 per month

For households unable to keep household consumption below the 60 kWh/month threshold, such as large low-income families, the standard tariff is the better option. Chapter 5 describes these and other electricity tariffs in detail.

2. Heating Consumption: Winters of 2001/02-2002/03

It is useful to compare the mild winter of 2001/2002, when the district heating price was around $18/gigacalorie (Gcal), with the severe winter of 2002/2003, when the district heating prices had risen to around $24/Gcal. (Reference Appendix 2.1.) The unfortunate coincidence of the first severe winter for several years and this substantial price rise represented a substantial challenge for Romania's energy social safety net.

Numerous factors determine the final household heating bill, including the heating source (district heating, natural gas with communal boiler, natural gas with own boiler), fuel price, National Reference Price (NRP)[11] for district heating, apartment size, severity of winter, and availability and level of metering and control.

Heating costs for low-income households using natural gas are not analyzed here, as district heat represents the highest-cost heating alternative at present. In the case of apartments heated using a single gas boiler for the building, costs are typically 50 to 70 percent of equivalent district heating costs, while for households heating with their own gas heaters costs can be very substantially lower as low-income households choose to heat only one room, lower the temperature, and turn off the heat entirely when no one is at home. Although natural gas represents the heating option of choice for households at present, this is because households are required to pay for gas at around 40 percent of its true market value,[12] so the economics of heating with district heat or natural gas may reverse in the future.

For district-heated households during the 2001/2002 winter, NRP was 600,000 ROL/Gcal (approx. $18.75/Gcal). A typical room uses between 0.6-1 GCal/month, and a typical apartment has 2.5 rooms, so consumption could range from 1.5 Gcal to 2.5 Gcal per apartment, with bills ranging from a low of 900,000 ROL ($28.13) to a high of 1,500,000 ROL ($46.88). Households in the very lowest income bracket of up to 900,000 ROL/month ($28.13) qualified for the largest HAP,[13] up to 700,000 ROL/month ($21.88). Hence, for households with lower heating bills, the balance payable after HAP was 200,000 ROL ($6.25), and for those with higher heating bills the balance payable was 800,000 ROL ($25.00). Heating bills were generally lower rather than higher, as that winter was mild.

[11] Romania operates a single tariff, the NRP, for all district heating networks (as described in Chapter 5) which is financed through a complex range of subsidies (as described in Chapter 3).

[12] Anticipated conclusion of a new World Bank natural gas study, which is not yet available.

[13] Heat Assistance Payments - a targeted low-income subsidy that is described in detail in Chapter 3 of this report.

At the beginning of winter 2002/2003, NRP was 0.8 million ROL/Gcal ($23.81/Gcal), so apartment and bills could range from a low of 1.2 million ROL ($35.72) to a high of 2.0 million ROL ($59.53).

Households in the lowest eligibility bracket of up to 1.053 million ROL/person/month ($31.34) qualified for the largest HAP: up to 0.98 million ROL/month ($29.17). For households with lower heating bills of 1.2 million ROL ($35.72), the balance payable was 0.22 million ROL ($6.11). For households with higher heating bills of 2 million ROL ($59.53), the balance payable was 800,000 ROL ($28.23).

As the winter proved to be severe, district heating companies supplied more heat,[14] and household heating bills rose. Maximum HAP of $28.23 was clearly too low for low-income households with an average income per person of up to $31.34. Thus, at the beginning of 2003, HAP rates were raised substantially to compensate for the colder weather. The eligibility level for the highest HAP payments was lowered to 0.75 million ROL/person/month ($22.50), and for such beneficiaries the maximum payment was raised to 1.656 MROL/household/month ($49.68).

For the lowest-income households, the new rates for the lowest-income households meant that (theoretically) for households with lower heating bills of 1.2 million ROL ($36),[15] HAP availability exceeded need by 0.456 million ROL ($13.68) — although in fact HAP is payable only up to the limit of the utility bill, and as the winter was severe, most households did not have low heating bills. For households with higher heating bills of 2 million ROL ($60), the balance payable after HAP was 0.344 million ROL ($10.32).

3. Fuel Expenditure - 1995-2000

Average expenditure statistics for wood/coal (combined), electricity/heat (combined), and natural gas for the above population categories are published by the National Institute of Statistics in its annual publication “Population Consumption Bulletin.”

Trends indicate that expenditure on wood/coal is declining for all household categories, and expenditure on electricity/heat and natural gas is growing. The highest monthly average expenditure on electricity/heat in 2000 was by the employed ($8.79), followed by the unemployed ($5.43), pensioners ($4.37) and peasants ($2.55). Full details are provided with the kind permission of the National Institute of Statistics as Appendix 2.2.

D. Impact of Energy Costs

1. Electricity

In general, electricity costs represent no problem for low-income households in Romania. It is, for example, sometimes argued that the subsidy bringing the monthly electricity bill down to $2.17 may be unnecessary, as the unsubsidized cost of $4.60 would also be affordable for low-income households if they hold consumption below 60

[14] For buildings that are un-metered, the heat utility estimates consumption based on substation meter readings.

[15] The actual average exchange rate of $1:33,600 is used for Nov/Dec 2002, and an estimated exchange rate of $1:33,333 is used for Jan/Feb 2003.

kWh. The design of the subsidy, which charges consumption above that threshold at a punitively high rate, does provide a substantial incentive for households to monitor their energy use and conserve aggressively.

2. Heat

Winter heating costs, particularly for district-heated households, represent the single greatest financial burden for low-income families.

During the winter of 2001/2002, for example [a better example than the winter of 2002/2003, which was unusually cold and represents a "special case"], heating costs for low-income families could have been difficult to afford, as even if receiving all subsidies and maximum assistance payments, the monthly energy bill could have sliced as much as 0.8 million ROL (US$25) from an income of *up to* 0.9 million ROL/month (US$28.13). In some cases heating costs actually exceeded household income. Fortunately, those were the exception rather than the rule, as the winter was mild and the net heat bill was as low as $6.25 in some cases.

The winter of 2002/2003, combining a steep price rise with severe weather, created an acute problem. For the lowest-income category of households eligible for HAP (incomes of up to $31/person/month), the heating bill could have been as high as $60/month. Even after maximum HAP payments of $29, a bill of $31 remained, so paying the heating bill could use up the entire household income. From January on, HAP rates were raised and a lower eligibility threshold of $22.50 per household member per month was introduced to assist the very poorest households. The maximum HAP rate was raised to $50/month for these households, leaving a more-affordable heating bill of up to $10/month. [HAP is described in detail in Chapter 3.] Even for households with the average national income of $110 per month, a heating bill of up to $60/month may be considered unaffordable. The UNDP, in its *Early Warning Report*, noted in July 2002 that even before the recent energy sector price increases, many people, particularly old people, could not pay for electricity and heat and that the problem of inability to pay is likely to worsen rather than improve. [See Appendix 2.3 for an extract of an article on the subject.] Because district heating is normally not controllable at the household level, it is an "all or nothing" heating solution, so increasing households are choosing to disconnect from district heating and use a controllable heating alternative.

a. Energy Deprivation vs. Energy Conservation

Before 1990, the concept of energy conservation was strongly equated with energy deprivation, e.g., sitting in the dark to "save energy." There is some evidence to suggest that when provided with the choice, low-income Romanian households are still choosing deprivation: doing without refrigerators and other appliances, lowering lighting levels, disconnecting from uncontrollable centralized heating systems, and using fuels that are dirtier and less convenient in order to save money. Sometimes, too, they simply do without.

Middle- and higher-income Romanians are increasingly choosing energy-efficient refrigerators and compact fluorescent lamps, controlling centralized heating systems, and continuing to use fuels that are cleaner and more convenient.

b. Recent Legislation on Disconnection

Law 116/2002 on Social Eviction prevents households from being evicted for non-payment of utility bills and in other circumstances. The law defines social eviction and places obligations on public, central, and local institutions to set up local boards to combat social eviction. Such aspects as the income level at which a person falls within the scope of that law are set from time-to-time by government decision.

Article 25 of the Law appears to create circumstances in which disconnection from electricity and other utilities may not be possible. Local boards ensure access of qualifying households and individuals to utility services and are empowered to set up memorandums with service providers to support part of the liabilities of such households. Financing will be provided by state budget through the Ministry of Public Administration, or to the local budgets as determined in the annual budget laws.

c. Weight of the Energy Bill in the Low-Income Family Budget

During the first half of 2003, the Romanian Energy Policy Association carried out a study entitled "The Weight of the Energy Bill in the Low Income Family Budget," which was sponsored by USAID and the Alliance to Save Energy (ASE). The study concludes that for many households, the heating bill actually exceeds total household income.

Highly detailed data is presented in duo deciles for both households using district heating and those using natural gas stoves for heating.

For the 2,840,833 households using district heating:

No. of Households	Percent of all households	Share of the heating bill in net household income
Poorest 53,564	Poorest 1.8%	94 – 164%
Next poorest 158,050	Next poorest 5.6%	46 – 97%
Next poorest 824,551	Next poorest 29%	25 – 110%

For the 603,721 households that heat using natural gas stoves:

No. of Households	Percent of all households	Share of the heating bill in net household income
Poorest 10,900	Poorest 1.8%	29 – 123%
Next poorest 27,285	Next poorest 4.5%	14 – 86%
Next poorest 210,046	Next poorest 34.8%	7 – 76%

The report breaks down the above data by number of occupants in a household and number of heated rooms.

Chapter 3
Energy Subsidies and Assistance Payments

A. Direct Subsidies: Electricity

There are no direct subsidies for the electricity sector in Romania. This is significant, as it means that the cost of operating the "social tariff" (see Chapter 5) is met by the power company through a cross-subsidy between households, not by the government.

The few households choosing electric heating do not qualify for HAP. Electric heating is rare in Romania, however, except as a backup heating source or to boost heat levels on exceptionally cold days.

B. Indirect and Cross Subsidies: Electricity

1. Social Tariff

The "social tariff" features cheap power below a threshold of 60 kWh/month and very expensive power above that threshold. For the month of June 2002, actual revenue from social tariff customers was $4.5 million, but if the households had paid the "standard tariff" it would have been $9.9 million. So, the monthly value of the subsidy was a little under $5.4 million. An estimate of the annual cost of running the subsidy can be calculated at $64 by simply multiplying the data for June 2002 by 12 months. On this basis, the value of the subsidy per household is $1.53 per household per month, or $18.39 per household per year. [Supporting data and calculations support appear as Appendices 3.1, 3.2 and 3.3.]

There is a case for suggesting that the value of the subsidy may be higher than $64 million. Using Electrica data for the six-month period January - June 2002, average monthly household consumption for social tariff customers was a little higher — 34 kWh/customer rather than 30 kWh/customer — which would be expected as the period included some winter months. Extrapolating this data increases the calculated annual value of the subsidy from $64 million to $74. Also, as 47,766 customers switched to the social tariff from other tariffs between April and June 2002, this trend indicates that the cost of operating the subsidy is gradually rising.

There is also, however, a case for lowering the $64 million estimate. Even at a level of around 30 - 34 kWh/hours per month, the economic principle of price elasticity of demand holds true, so if Electrica withdrew the social tariff and charged the standard tariff instead, demand could be expected to fall. In addition, it is reasonable to assume that collection costs would be higher and non-payment a greater problem, as the higher standard tariff would be less affordable for low-income customers.

In summary, although "within the range of 60 to 70 million dollars" may be a better estimate, $64 million seems a reasonably robust valuation of the social-tariff subsidy.

2. Compensation Issues

a. Electrica

Not only does the Government not compensate Electrica for operating the social tariff, it has also raised the cost of operating the tariff by raising the threshold from 50 kWh to 60 kWh. That decision came as something of a surprise to both Electrica and ANRE (the regulatory authority for electricity and heat), who already considered the optional tariff to be over-subscribed. The GOR explained this action and its consequences in the August 2002 memorandum to the IMF: "A reduction in electricity subscription charges in March 2002, motivated by social concerns... led to the nonobservance of a structural performance criterion of March 2002 by a small amount."

When interviewed in April 2002, Electrica was concerned that, because many consumers habitually consume within the range 50 - 60 kWh/month, the raised threshold could lead to a rise in the number of social-tariff subscribers — perhaps to 50 percent of households. A review three months later revealed that there was indeed an increase, with 47,766 more households opting for the social tariff, but that the impact was lower than expected. Subscribers to the tariff increased from 3,495,322 (January 2002), representing 43.8 percent of household customers, to 3,477,556 (June 2002), representing 44.4 percent of the 7,876,511 household customers.

b. Termoelectrica and RADET

RADET, the Bucharest district heating utility, claims that Termoelectrica's heat price is 50 percent too high. RADET bases this figure on the heat price for the City of Iasi, which recently installed its own plant.

If this claim is accurate, the impact of Termoelectrica overcharging RADET for heat would be to reduce the final cost of bringing heat to households from $22.3/Gcal to $17.94/Gcal, which implies that the government subsidy to RADET could decrease from 24 percent of the total cost of heat supply to only 4 percent. A table with data supporting this assumption appears as Appendix 3.4.

RADET's preferred solution to the above would be to take over Termoelectrica's generation assets in Bucharest, a paperwork transaction since both are state owned.

3. Non-Payment as a Form of Subsidy

a. Industry

Non-payment for electricity by state-owned companies is a persistent problem. Tolerance of such non-payment, known in Romania as "financial blockage," is a form of government subsidy. Technically bankrupt companies remain afloat by simply not paying their bills to other state-owned companies.

The financial blockage has dogged Romania throughout the transition period. Although energy companies enjoy a theoretical right to disconnect non-paying companies, politicians intervene to prevent this if it could lead to factory closures and resulting social instability. The problem is particularly acute in towns that grew up around very large

manufacturing facilities during the communist era and are not commercially viable businesses today.

Energy sector losses of some three percent of GDP in 2002[16] are a substantial barrier to future privatization efforts and are a main point of discussion between the GOR and the IMF, which has set a structural conditionality about improving collection and discontinuing energy supplies to industrial users with the weakest payment records.

The solution to the financial blockage is not a black-and-white issue, but rather one of choosing among four options.

	Option	Implications for the government
1	Factory closure	Impact on local employment levels politically unacceptable.
2	Unconditional privatization	Risky: the new management would typically downsize, so the impact is similar to closure.
3	Conditional privatization (on investment and maintaining employment levels)	Too risky for investors: companies are typically overstaffed and require fundamental restructuring.
4	Restructure (i.e., investment by the state to prepare for conditional privatization)	Requires investment capital the government doesn't have, so toleration of non-payment is an attractive political solution.

Predictably, the practice of tolerating non-payment for electricity has been exploited by some industrial managers who *could* pay for energy but know that investing the money for the energy bill elsewhere and hence putting the company into a position whereby it *cannot* pay does not result in the withdrawal of energy supplies. Ironically, the solution for the government — stronger control of the management and financial affairs of the state owned companies by the competent ministry — is totally at odds with the goal of removing day-to-day state intervention in industry.

The problem of the financial blockage may not be fully resolved until the electricity distribution companies have been privatized. The World Bank indicated that one of the barriers to lending additional funds for electricity sector reform under the PESAL II (Energy Sector Reform component), which is already negotiated with the government, is that the Bank will not approve the loan until the collection rate of electricity payments improves.

(1) Escrow Accounts. Such accounts have eased the financial blockage to some extent. Many district heat companies contributed to the financial blockage in the past by

[16] Source: International Monetary Fund

not paying their gas supplier or heat generator. Government Decision 115 of September 2001 introduced mandatory escrow accounts for energy companies, diverting all revenue — including payments from customers, direct government subsidies, and HAP funds — to the accounts. Heat companies are now forced to pay energy bills first, even before salaries and vehicle maintenance.

b. Households

Unlike some countries in transition, Romania has suffered little from the problem of widespread non-payment for electricity by households. Electricity bills are payable within eight days of issue; penalties for late payment were recently reduced from 0.2 percent to 0.1 percent per day. Disconnection rates for non-payment are low, as customers respond to the threat of disconnection.

(1) Disconnection. It is not presently known whether non-payment and high penalties for late payment are an issue for low-income electricity consumers. According to Electrica, no one collects data on the extent of the problem, and there is no national policy for dealing with consumers who may be too poor to pay. Electrica has no internal policy in this respect, and the regulator ANRE has not created a regulatory regime to monitor and control the approach to non-payment, disconnection, and reconnection of households.

(2) Electricity Theft. Electrica does not know the extent of electricity theft by households; if they knew about it they would stop it. The company believes the extent to be "probably very slight."

C. Direct Subsidies: Other Energy Sectors

1. District Heating

a. National Reference Price

All Romanian district-heated households pay a single tariff, the National Reference Price (NRP). A direct subsidy meets the difference between the NRP and the tariff that would otherwise be required for the district heating company to recover its costs.

Payments to district heating companies depend upon a range of criteria such as number of households, efficiencies of the system and company, and fuel costs — as a company using light fuel oil may have twice the fuel costs of one using natural gas.

Estimates of the scale of the subsidy vary. The Ministry of Public Administration quoted 2,600 billion ROL ($145 million)[17], for the year 2002, of which 55 percent ($80 million) came from central government sources and 45 percent from local government sources. According to the newspaper Curieriul National, in November that year, the budget was raised by a further 630 billion ROL ($18.8 million)[18].

[17] Source: Interview, Ministry of Public Administration, April 2002.

[18] Source: Curierul National, November 5th 2003.

APER quotes $112.3 million in 2000; $123 million in 2002; and $137 million in 2003, citing the IMF and Ministry of Public Finance as its sources[19].

RADET absorbs around half of the overall subsidy budget – an estimated $60 million for the winter of 2002/2003[20]. The subsidy was fully funded from the state (national) budget until winter 2001/2002,[21] when it was changed to 55 percent state: 45 percent county and then to 45 percent state: 55 percent county. [Inability of counties to pay their share of the district heating subsidies is an emerging problem in some parts of Romania.] The aim is to create a local incentive to save. A table detailing the district heating budget for 2002, with own revenue and direct subsidies by quarter, appears as Appendix 3.5.

The government's contribution to district heating subsidies is spent through the county budgets, appearing as a separate budgetary item. The government contribution represented 3.5 percent of total county budgets in 2001, then falling to 2.4 percent in 2002 as a result of the decision to pay only 55 percent of the subsidy. An overview of the county budgets, highlighting central government's contribution to district heating subsidies, appears in Appendix 3.6 (ROL) and Appendix 3.7 (USD).

The level of the NRP[22] influences the level of subsidy that the district heating companies require. ANRE, the regulatory authority for electricity and heat, sets the NRP using a document audited by the Ministry of Public Finance and assessed as being in accordance with the legislation in force.

b. Commercial Consumers

In urban centers, particularly downtown Bucharest where there is a shortage of office space, it is common for offices to be established in traditionally residential apartments. As these commercial consumers are not eligible to pay the subsidized NRP for district heat, they should be paying the full price.

When owners associations (OAs) collect money to pay the heat bill, they typically charge apartments used by companies at double the household rate. This does not necessarily mean that the district heating company receives more, as the extra money may be used to further lower heating bills for the residential apartments in the building. In some cases businesses do not inform OAs that an apartment is being used as office space.

According to APER's executive director, RADET is now starting to try to capture this lost revenue by entering into direct contracts with the owners of apartments used by businesses.

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[19] Source: "The Weight of the Energy Bill in the Low Income Family Budget", Romanian Energy Policy Association, sponsored by USAID and ASE, 2003. Page 33.

[20] Source: Capital, 6th March 2002.

[21] Government Decision 15/2001.

[22] The National Reference Price and other tariff issues are described in Chapter 5 of this report.

In summary, although some businesses are benefiting from the 'household' heat subsidies, the significance for low-income consumers is low because the scale of the problem is small.

c. World Bank Position on Heat Subsides

According to the World Bank's Country Strategy for Romania of August 2001, the Bank supports the continuation of targeted heat payments as the Bank's approach is to focus on making the power sector viable.

2. Heat Assistance Payments

HAPs are provided to low-income households to help pay for district heating, natural gas, or non-network fuels during the five winter months. HAP is payable in addition to any other social assistance benefits that low-income households may receive. The money is paid directly to the utilities except for households using non-network fuels, who receive cash.

Although the Romanian HAP system is known as the *coupons* system locally, is not a voucher-based system as such. The “coupon” is an administrative document that passes between the municipality and an owners association to calculate the balance of the heat or gas bill that remains payable by each beneficiary household after the subsidy for the building (deduction from the heating or gas bill) has been taken into account. The coupon has no cash value, though. This is significant, as voucher-based systems that produce a form of secondary currency are usually considered to be undesirable[23].

The scheme has been running for two winters: 2000/2001 and 2001/2002. During the first year, households applied directly to the municipality for assistance, but the mechanism changed to incorporate the OAs, who collect applications for the all low-income consumers in the building and make a single application to the municipality.

HAP policy is defined within the Ministry of Labor and Social Protection; implementation is carried on entirely at the municipal level. The public apply to the municipalities, who look at income levels, decide if the applicant meets eligibility criteria, and pay accordingly.

HAP was established partly as a result of World Bank influence, the Bank asked the government to find a solution for low-income households by subsidizing households in a targeted way as part of the FESAL (structured loan) negotiations.

According to a recent APER report, HAP’s budget was $21.8 million, $24.4 million, and $32.2 million for the calendar years 2000, 2001, and 2002 respectively.[24] These data are summarized in Appendix 3.8.

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[23] International experience suggests that voucher-based systems are usually costly to manage and can be open to corruption.

[24] : “The Weight of the Energy Bill in the Low Income Family Budget”, Romanian Energy Policy Association, sponsored by USAID and ASE, 2003.

According to the same report, at the end of 2002, some 370,000 households received HAP: 190,000 for centralized heating, 23,000 for natural gas, and 157,000 for solid fuels. The monthly cost of the HAP subsidy was 115 billion lei, of which 47 billion lei went for centralized heating, 3 billion lei for natural gas, and 65 billion lei for solid fuels.[25]

These data imply that the average payment for a household heating with solid fuels was $12.30, but average payments for those heating with district heating and natural gas were only $7.35 and $3.88 respectively. If these data are correct, it is unsurprising that some households choose to heat with solid fuels despite being connected to district heating or gas networks. Calculations that support these conclusions are provided in Appendix 3.9.

a. Legal Basis of HAP

The legal basis of the eligibility rules and targeting criteria for HAP were governed by Law 67/1995, the Social Assistance Law, until 1 January 2002, when a new Law — 416/2001: the Minimum Income Guarantee Law — came into force. The main difference between the SOL and MIGL is that eligibility criteria were tightened, but the basic targeting norms remained unchanged.

A ten-point methodology for applying HAP, set by Government Decision 162/1999, defines households and describes the application, payment, and accounting process. That methodology is reproduced in translation as Appendix 3.10 of this report.

b. Targeting Rules and Eligibility

Until the end of 2002, the targeting rules were as follows: applicants submitted applications for social assistance, and a social worker verified the application. It is noteworthy that households with large apartments were ineligible for HAP, a “large” apartment being defined as 37 square meters (420 square feet) for one person or 42 square meters (452 square feet) for two persons, which is very small. Hallways and balconies are not included in the calculation.

The system was criticized, as sometimes households that were “obviously poor” broke the eligibility rules through, say, ownership of a 30-year old automobile (that didn’t work) or two black-and-white TVs (one to watch, one for spare parts); both were grounds for disqualification.

Government Ordinance 6/2003 introduced new criteria as grounds for disqualification from social assistance: ownership of a computer, fax machine, more than one color TV, or a new car; help from abroad; savings in the bank; a pedigree dog; jewelry; a microwave oven; and a second apartment. The rules were updated in response to criticism that some households who were “obviously well-off” were benefiting from social assistance.

[25] Ibid. APER in turn cites Government Emergency Ordinance 121/2002 as the primary source.

In January 2002, HAP eligibility rules were tightened, as the Social Assistance Law was abrogated and the Minimum Income Guarantee Law came into force.

The main difference between the old system and the new system is that the new system does not calculate the income needs of a household based linearly on the number of households. The old system used a very simple average income per-person based targeting system, whereas the new system defines HAP beneficiaries as *households* that fall below the Minimum Income Guarantee, which features a more complex household-based targeting system.

The new eligibility criteria substantially reduced the number of HAP beneficiaries. For example, Bucharest Municipality Sector 1 had 10,000 eligible HAP households before December 2001, but only 400 eligible households after January 2002.

c. HAP Raises in Winter 2002-2003

One of the HAP raises during that winter was a planned rise, the other unplanned. The first increased heating-related transfers to eligible households by 40 percent for centralized heating, 25 percent for natural gas, and 20 percent for wood and coal compared with the amounts effective in the first quarter of 2002. The income ceilings for eligibility for heating-related new transfers increased by 17 percent in nominal terms on November 1, 2002. The income ceilings for the minimum-income guarantee scheme increased by 17 percent in nominal terms on January 1st 2003, and will remain unchanged during 2003.

The second, unplanned rise came about because HAP could not meet the needs of low-income consumers in what turned out to be a severe winter.

d. Amounts Payable to Low-Income Households

Specific amounts payable under HAP are set by government decision from time to time. Rates are always highest for households using district heating, lower for those using natural gas, and lowest for those using solid fuels; these variations reflect the relative costs of the different forms of heating. District heating and natural gas payments are paid to the utility on the behalf of the household, and payments for other forms of heating in cash.

Although solid-fuels HAP levels are nominally based on the costs of heating with solid fuels, all households that qualify for social assistance payments and are neither district heating nor natural gas consumers receive this payment.

Rate changes are quite frequent, typically at the beginning and the middle of each winter, taking into account how well the previous rate appeared to be meeting the needs of households, energy price rises, and any fall in the value of the ROL since the previous rate was set.

The level of HAP payments for district heating more than doubled in dollar terms between the winters of 2001/2002 and 2002/2003, reflecting a rise in the NRP from

$18/Gcal to $24/Gcal over the same period[26]. The increase in HAP payments for natural gas customers was more modest.

A comparison of HAP payments for the winters of 2001/2002 and 2002/2003 follows.

e. HAP Rates at the End of Winter 2001/2002 (when NRP was $18/Gcal)

Monthly income per household member and the level of monthly payments per household were:

Jan/Feb 2002	**HAP for heat**	**HAP for gas**	**HAP for wood**
Up to $28.13	$21.88	$12.50	(flat rate for all
$28.13 - $34.38	$13.13	$ 7.50	qualifying households
$34.38 - $43.75	$6.56	$ 3.25	was $7.81).
$43.75- $56.25	$3.44	nil	

Nov/Dec 2002	**HAP for heat**	**HAP for gas**	**HAP for wood**
Up to $31.34	$29.17	$14.88	(flat rate for all
$28.13 - $34.38	$17.50	$ 8.93	qualifying households
$34.38 - $43.75	$8.75	$ 4.46	was $8.93).
$43.75- $56.25	$4.58	nil	

Jan/Feb/Mar 2003	**HAP for heat**[27]
Up to $22.50	$49.68
$22.50 - $30.00	$32.40
$30.00 - $37.50	$21.60
$37.50 - $52.50	$10.98
$$2.50 - 63.180	$7.20

Full details of thresholds and rates since the introduction of HAP in 2000, in ROL and USD, with references to the Government Decisions under which they were established are detailed in Appendix 3.11.

[26] The large increase may also have taken into account that the winter of 2002/2003 was proving to be the most severe for several years.

[27] Other HAP rates rose less sharply. This recent data is not fully reliable as it is from a secondary source and had been announced, not published at the time of writing, but it will be broadly correct.

f. A Coupons System

From a procedural point of view, HAP is a coupon system: that is, municipalities issue coupons to the low-income consumers who use it to pay the utility, or in the case of households living in apartment buildings, to pay the owners association, which in turn pays the utility.

The system is straightforward. A coupon bears the value of the payment, and the household pays the balance. Unlike in some other countries, where the coupon is only valid if the customer can demonstrate that previous utility bills have been paid, coupons are valid in Romania in any case. So, if a customer is already in debt for gas or heat, the debt is reduced or grows more slowly than it otherwise would.

g. Role of Owners Associations

In Romania, district heating companies normally contract with the building rather than individual apartments, so the OAs collect money from all households to pay the heat bill.

As a natural extension of this role, OAs coordinate HAP coupons for eligible consumers in the building, explain the system, help to fill in forms, etc. An advantage of this system is that capture of eligible households is high. The OA cashier, typically a household in the building, usually knows which households have low incomes and alerts them to the availability of HAP. Appendices 3.12 through 3.14 provide further calculations and analysis of the impact of HAP on various size households and under various weather conditions.

h. A HAP Pitfall

In some towns, households that are connected to district heating networks choose the lower, cash-based form of HAP (nominally for solid fuels) and either disconnect from the district heating network or just stop paying the district heating bill. In this context, the HAP system may be contributing to the collapse of some of the district heating networks.

The extent of this practice varies according to the approach of the local municipality. Bucharest municipality does not tolerate this practice, but it happens elsewhere.

D. Indirect and Cross-Subsidies: Other Sectors

1. Cross-Subsidy between Indigenous and Imported Natural Gas

Romania receives more than 80 percent of its natural gas from low-cost indigenous production (about $40/BCM at the wellhead) and 20 percent from high-cost Russian imports (about $130 at the border). A table describing indigenous production levels and imports from 1995 - 2001 appears as Appendix 3.15.

A political decision to sell indigenous gas cheaply, combined with a cross-subsidy between household and industry, results in extremely low gas prices for households. The value of these subsidies has been calculated as $333 million in 2000 and $365 million in 2001, equating to an average subsidy per household of $133 in 2000 and

$146 in 2001. These data should be treated with some caution as they are based on a number of assumptions, sources, and calculations, but they are believed to be reasonably robust and are detailed in Appendix 3.16.

The IMF measured the total value of the "cheap gas" policy and toleration of non-payment (which differs from the estimates provided above that only include the household sector). The conclusion was that low prices represented a subsidy of $1,373 million in 2001, and that a further $189 million of revenue was uncollected during the same year, totaling a combined implicit subsidy of $1.56 billion or 3.9 percent of gross domestic product (GDP).

The IMF also projects that gas price rises and improved collection rates will lower the subsidy to around 1.6 percent of GDP by 2003. IMF calculations supporting the above are reproduced as Appendix 3.17.

2. Tolerance of Non-Payment

a. District Heating

Non-payment of district heating bills by residential consumers is a serious problem in Romania. The problem is complex, however. Heating costs are generally not controllable, so households cannot reduce the monthly bill that, during the winter, takes up an unacceptably high proportion of household income, even for better-off families. Five options are open to such households:

- Don't pay
- Pay late
- Disconnect the apartment from the heating network
- Disconnect some radiators from the heating network
- Install metering and controls, and consume heat within the household budget

As the last solution is a communal one that cannot be carried out by a household acting in isolation, the options involving disconnection and non-payment are the only practical solutions available to many households. There is no effective law in place that can be used to enforce household payment of district heating.

b. Owners' Associations

An individual household that does not pay for heat (or pays late) is initially a problem for the OA, as the building and not the apartment is the district heat customer.

All households pay a utility deposit of around $100 to the OA ("fondul de rulement") when buying their apartment. OAs dip into this fund to make sure that utility bills are paid on time and thus avoid late payment penalties even if some households do pay late.

Day-to-day OA transactions are carried out by a cashier, who is often a householder in the building, so can apply a personal touch to addressing non-payment issues. The

cashier usually knows the difference between a can't-pay and won't-pay household and will try to help the former while exerting pressure to pay on the latter.

For households in genuine difficulty, approaches vary. Households that are willing to pay but can't manage the payment can sometimes pay a smaller sum over a longer period. In this case, some OAs pay the DH company or gas company on time anyway, while others pass on this cost by paying the DH company proportionally later.

There are no official statistics from the OAs, but according to an official of Bucharest Municipality, who is in regular contact with the cashiers from a large number of OAs, the practice of OAs settling heat and gas bills by their due date during the winter and allowing households to catch up during the summer is very common indeed.

For mixed-income buildings with a very small proportion of low-income consumers, there is anecdotal evidence of OAs absorbing the cost of heat or gas for defaulting households by increasing the sum payable by the other households. More typically, the household slowly builds up a debt to the OA, which is normally cleared when the household is in a better financial position or perhaps when the apartment next changes hands.

c. Adverse Effects Upon the Utility

The ability of OAs to absorb non-payment is limited to mixed-income buildings that are well-managed. Poorly managed buildings or those with a large proportion of low-income households are unable to absorb debt as just described, so the OA pays the utility only what it collects. This may represent full payment from some apartments, partial payment from others, and nothing from still others. At this point the OA falls into debt.

The approach utilities take to non-payment OAs varies from town to town. District-heated buildings may not be disconnected during the winter, although reducing the temperature supplied is a solution which some companies apply where technically feasible.

Disconnecting the hot water (washing water) is a common solution which, according to RADET, is applied if a building falls into arrears by two months. Disconnecting radiators in the apartments of defaulting households is another solution, but it is not clear that the DH companies have the legal right to do this, taking into account that the heat company does not own the internal heat network of the building. However, it was reported in the media that some district heating companies entered and disconnected individual apartments during the winter of 2001/2002.

Litigation is an option for the district heating companies, some of which have won court cases to force households from their homes. The court decisions proved to be unenforceable, partly as a result of a weak judicial system and partly as legislation was unclear, not least because the OA rather than the household was nominally responsible for payment. The recent Law 116/2002 and norms based on the Law have clarified the legal situation to some extent, but not fully. Households may now not be evicted for non-payment of heat and electricity (social eviction).

There are said to have been cases in which OAs have forced households who do not pay for communal services to leave the building, but no hard facts were available on this.

It is understood that one solution under consideration is to register energy debt against the household, so that it becomes impossible to sell an apartment until all debts are cleared.

d. The Extent of Non-payment and Late Payment Varies from Town to Town

In November 2000, household debts for district heating were estimated at 1,400 billion[28] Lei ($56 million). By April 2002, household debt in the Northern city of Iasi alone was some 650 billion ROL ($20 million). The problem of non-payment is less acute in the capital,[29] where around 30 percent of customers pay late, but generally do pay.

E. Impact of Subsidies and Assistance Payments

1. Reducing Poverty Levels

The social tariff for electricity costs around $64 million per year, reducing the average monthly electricity bill for 44 percent of households from $4.60 to $2.17, a saving of $2.43.

Direct subsidies to district heating companies to pay the difference between the cost of supply and the NRP totaled $145 million in 2002. Artificially cheap natural gas to fire the district heating boilers lowers the costs of heat supply.

Toleration of late- or non-payment by heat customers is very common in some areas, a practice that drives up costs and has led to the collapse of 72 of the 251 networks in the last two years. Households then must find another, often inappropriate, heating solution (e.g., burning wood in apartments).

HAP for households using district heating, natural gas, and solid fuels cost $62 million in 2001 and $18 million in 2002 (budget). For many households, HAP is adequate and covers their heating costs. The worst case “official” scenario[30] is a single low-income district heated household with an income of $56.25/month, where HAP reduces the average monthly winter heating bill from $23.92 (41 percent of income) to $19.47 (35 percent of income). However, if the same household is billed 30 percent more for heat than the official average, HAP reduces the monthly winter heating bill from $29.81 (53 percent of income) to $26.37 (47 percent of income), leaving the household with $0.96/day.

As noted, all households using natural gas benefit from artificially cheap natural gas, which is an example of a subsidy with very high coverage but no targeting. In fact, as

[28] Source: 'Cat costa 1,400 miliarde de lei?', Economistul, 22 November 2000.

[29] Source: RADET, April 2002.

[30] Calculated using HAP rates for the winter of 2001/2002

higher-income households tend to consume more, it could be said to be targeting the rich. The value of this subsidy is estimated as $133 per household in 2000 and $146 per household in 2001, although the main benefits go to households that use gas for cooking and heating (as opposed to cooking only), who use more gas and hence benefit more from the subsidy. This subsidy further stimulates households to fit gas boilers and gas heaters in their apartments as an alternative to district heating, although this may prove to be a false economy as gas prices are scheduled to rise sharply in the medium term.

A targeted inverted block tariff for natural gas costs $40 million per year and will benefit eligible households by an average of $59.20/year, or $4.93/month.

2. Removing Barriers to Utility Privatization

The social tariff for electricity, costing $64 million per year, is paid by the power companies and represents a barrier to utility privatization. Best practice would be for the government to fund this subsidy from the social assistance budget.

The recently established inverted block tariff for natural gas, costing $40 million, is another example of Government passing the costs of its social program to the utilities.

The combined impact of direct subsidies for district heating subsidies and the share of HAP that is paid to district heating companies were described succinctly by Mihai Mereuta of Foundation for Civic Action (FCA). As all of the subsides go to the heat company and nothing toward reducing heat consumption through demand-side energy efficiency and metering, it can be forecast with some certainty that the problem of households being unable to pay for heat will recur every year. Mereuta estimated that one million apartments could have been metered by 2002, if the subsidies had been spent differently, creating 3,000 jobs. He considers that the government subsidizes district heating companies through HAP in order to create the illusion of a social subsidy rather than utility subsidy, hence avoiding unwelcome interest from the IMF.

The IMF assessed the cost of implicit energy subsides (i.e., not including explicit subsidies such as the Heat Assistance Payments) at more than $2 billion for the year 2001, representing 5.3 percent of GDP. IMF statistics on the extent of electricity, heat, and natural gas subsidies in 2000 and 2001, as well as projections for 2002 and 2003, are reproduced as Appendix 3.18.

Chapter 4
Energy Efficiency

A. Energy Efficiency and the Low-Income Household

As low-income electricity consumers generally choose the social tariff, they have a very strong economic incentive to keep consumption below 60 kWh/month. To achieve this, many households do without refrigerators, saving the low-cost quota of power for lighting and television. Some medium-income households — particularly single occupancy households — invest in compact fluorescent lamps (CFLs) and low-energy refrigerators to stay below the threshold.

Low-income district heat customers are increasingly disconnecting from the network, as their bills are unaffordable. Some customers ask for one radiator to remain connected, so there is heat in at least one room and a correspondingly lower bill.

Apartments that use gas for cooking, which is metered at the level of the building instead of the apartment, light their cooker rings to boost comfort levels during cold spells or when the district heating system under-performs. These householders benefit thereby from almost free heat in the kitchen, as a household in a building with 50 apartments pays only 1/50th of the cost.

Low-income households with gas meters and heaters typically have relatively low heat bills, as they have individual autonomous control of their heat use and turn the heat off when they are away from home. It is commonplace for these households to heat only one room instead of the entire apartment. Typically, the appliances used are low-efficiency “soba” stoves, many of which were originally designed as wood stoves and have been converted for natural gas use. Such households have an incentive to weatherize, as they pay for the heat that they use.

B. Energy Efficiency of Household Appliances

1. Electrical Appliances

a. Heaters

There is no data on ownership and use of electric heaters by low-income households, but according to both ANRE and Electrica, electrical heating does not make a substantial impact on winter peak demand in Romania[31].

Ownership of electric heaters may be quite high, as they are durable products, but their use is limited to very cold days when they typically supplement district heating.

For low-income households, the social tariff provides a strong financial disincentive to use electric heating in any circumstances.

[31] ANRE and Electrica were interviewed in April 2002 – before the severe winter of 2002/2003.

b. Promotion of Efficient Appliances

Thus far, Electrica has not been involved in household energy-efficiency projects, and its four-member Energy Efficiency Department at company headquarters in Bucharest was closed at the beginning of 2002. The focus is now on improving metering, protecting revenue, and reducing theft.

Electrica asked ANRE to allow recovery, through the tariffs, of revenue invested in energy-saving equipment on the behalf of customers, noting that this is envisaged in Ordinance 63/1998: "the Electricity Law." Although this has not been allowed by the regulator in the past, Electrica was hopeful that ANRE's position on this issue will change.

Free energy-efficiency advice and tariffs information are available at Electrica payment centers, of which there are 12 in the capital and many more throughout Romania. These resources feature interactive screens with lots of information. In addition, 4 million copies of "How to Evaluate Your Electricity Bill" were disseminated between the 7.1 million households.

c. Energy-Efficiency labels

Adoption of energy-efficiency labels by Romania, as part of the EU accession process, has brought about substantially more-efficient appliances on the market, almost all of which are now "A" or "B" rated (high-efficiency) models, including those produced by local manufacturers.

Labeling has little impact on low-income consumers who generally do not own such appliances. Even a high-efficiency refrigerator would consume perhaps 40 to 45 kWh of the 60 kWh quota of cheap power available under the social tariff. Also, those low-income consumers who do run refrigerators are more likely to run old or secondhand models, so the impact of labeling may take several years to filter through.

2. Natural Gas Appliances

Small-boiler sales are increasing, but energy efficiency of the boilers does not appear to be a consideration. According to ARCE, the Romanian Energy Policy Association, many boilers are secondhand units from neighboring Hungary. Small boilers are typically vented through apartment windows, and carbon-monoxide poisoning is understood to be a growing concern.

Government Decision 220/2002 sets minimum efficiency standards for hot-water boilers for sale on the Romanian market, including penalties of up to 100 million ROL ($3,125) for non-compliance and 50 million ROL ($1,563) for failing to display energy-efficiency labels. Enforcement is the responsibility of the State Inspection for the Control of Boilers, Pressure Vessels, and Lifting Equipment, which is subordinate to the Ministry of Industry and Resources[32].

[32] Source: APER Info Romania, No. 64, April 2002.

Official Gazette no. 674 [11 September 2002] contains new norms for installing boilers in apartments and apartment buildings, including conditions for the use of secondhand equipment.

C. Weatherization

1. New Buildings

In April 2002, the President of ARCE[33] was receiving regular complaints that new buildings are continuing to build "vertical-loop" heating and water systems.[34] New regulations were under preparation to address this, including the legal power to disconnect/refuse to connect new buildings that do not comply with the regulations in force. Enforcement will be carried out by the Ministry of Public Administration through its well-developed building inspection system.

2. Thermal Insulation Companies

A number of manufacturers of expanded and extruded thermal insulation are present in Romania, including Swisspor (Swiss), Austrotherm (Austria), Isopor (Greece), and Europlant (Turkey). Expanded thermal insulation ranges in quality from the least effective (8 kilograms (kg)/cubic meters) to the most effective (30kg/cubic meters), while the more expensive but higher-quality extruded thermal insulation begins at 30kg/cubic meters.

Builders do not typically specify the quality of thermal insulation but simply ask for the cheapest, which is 8kg/cubic meters expanded thermal insulation. According to one commenter from the industry, this material is "good for packing glasses, but useless as an insulating material." The same person considered that 15kg/cubic meters of expanded insulating foam should be the absolute minimum standard.

3. Older Buildings

The Romanian building stock[35] consists of some 8 million households living in 4.6 million residential buildings, of which 53 percent are over 40 years old, 37 percent are 20 to 40 years old, and only 20 percent were built less than 20 years ago. Of the above, 56 percent are single-family households, mainly in rural areas; 39 percent are apartment blocks, mainly in urban areas; and 5 percent are multi-family buildings but not apartments. Appendix 4.1 summarizes these data.

Government Ordinance 29/2000 creates a National Thermal Rehabilitation Program to be managed by the Ministry of Transport, Public Works and Housing (MTPW&H), in consultation with ARCE. The program will involve the development of regulations,

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[33] Mr. Sorin Apostu, in 2002. Mr. Mihai Voronca took over as Director in 2003.

[34] For example, the water for the bathroom connects to bathrooms in apartments above and below, but not to the kitchen in the same apartment. Disadvantages for metering are that each room, rather than each apartment, must be metered separately, and it is necessary to enter an apartment to read meters rather than locating them in common hallways.

[35] Source: Energy Charter Secretariat, PEEREA Review of Romania (draft), 2002.

building certification and demonstration projects, but there will be no large-scale investment in thermal rehabilitation of residential buildings. According to FCA the program is expected to focus on public buildings.

The Ministry of Public Administration confirmed that thermal rehabilitation of apartment blocks is not presently on the political agenda, and there are no plans to provide funding in this area. Typically, apartment buildings are thermally inefficient. According to Patterson[36], building standards in force until 1985 were based on the mistaken idea that thermal insulation materials should be avoided, as manufacturing them used large amounts of energy. As a result, panel-built apartment blocks constructed in the 1970s and early 1980s recorded an overall thermal resistance of less than 0.7 m^2-K/W. After 1985 the official standard rose to 1.15-1.25 m^2-K/W, but buildings typically did not actually meet these standards. Appropriate values for exterior walls, roof, floor, doors and windows are 3.3, 4.0, 2.0 and 0.5 m^2-K/W, respectively.

A study by Icemenerg assessed the technical potential for energy savings in Romanian households of a number of energy-efficiency measures such as insulating doors and windows, improving controls, improving maintenance, and installing individual measurement systems. The 1994 study found the technical potential for most forms of improvement to be quite high — typically with payback periods of 4.5 years. As this study was carried out in the early 1990s, in an environment of low energy prices, it is reasonable to assume that the payback periods will have fallen sharply. The table is reproduced as Appendix 4.2.

A 2002 study[37] by the Romanian Institute of Building Design, Research and Software (IPCT) presents a range of scenarios for the thermal rehabilitation of buildings, with payback periods of between 7.9 and 8.6 years. The study notes that despite the apparent economic benefits, there are no plans to finance such investments.

4. Centrally Heated Apartments

The majority of low-income consumers living in apartment buildings cannot lower their heat bills by weatherizing. In the absence of household metering, there is no economic incentive to install or use equipment to regulate heat consumption; thus, the most popular form of regulating temperature remains opening and closing the window.

Although weatherization can increase comfort levels, this is not always the case. In some buildings and areas, heating systems are poorly controlled: those households nearest the boiler plant receive too much heat on warmer winter days, and those further away receive too little.

For households receiving too little heat, weatherization can reduce the need to use a secondary source of heating on cold days when the centralized system cannot cope.

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[36] 'Rebuilding Romania - Energy Efficiency and The Economic Transition', Walt Patterson, Royal Institute of International Affairs 1994.

[37] This study was not available to the authors, but it is quoted in the Energy Charter Secretariat's Draft 'In-Depth PEEREA Review of Energy Efficiency Policies and Programmes of Romania", 2002.

D. Metering and Control

Although the relationship between the price signal and energy efficiency is well understood, it is often forgotten that metering and control are the essential practical links that make the relationship work.

1. Metering and Household Electricity Demand

Electricity is metered in every Romanian household, so households pay according to their actual consumption and are disconnected if they do not pay. As most low-income consumers subscribe to a social tariff[38] that features very high costs for consumption above a low threshold of 60 kWh/month, subscribers to the tariff — even those owning electric heaters — rarely use them, even on the very coldest days.

A model of the impact of introducing individual autonomous control and metering for all utilities can be derived by analyzing consumer behavior in the Romanian power sector. Households have demonstrated that they will take extraordinary measures to reduce energy consumption if provided with an economic incentive to do so. Although 60kWh/month is a very small amount of electricity — a typical U.S. household consumes this much power in a weekend — 44 percent of Romanian households opted for the lifeline tariff, and 95 percent of those households succeed in keeping consumption below the 60 kWh threshold.

2. Lack of Meters in Other Energy Sectors

This is a complex issue affecting the power utilities, which generate most of the heat for the district heating systems in Romania, and also affecting the district heating, natural gas, and water utilities.

District heat and hot water, natural gas (nominally for cooking), and cold water are generally unmetered in Romania or are metered at the level of a building rather than an apartment. As a result, consumption of heat and water, in particular, and to a lesser extent natural gas, are very much higher than they would be if households controlled and paid for their own consumption.

Low-cost metering and control solutions exist for all utility sectors, but there are some powerful opponents to reform, including in some cases the utilities; these fear the impact on revenue streams if households respond to the price signal, as electricity consumers have done by substantially cutting consumption levels. While the water utilities know that they provide an essential service and will survive in the long-term whatever happens, the district heating utilities are losing market share rapidly. District heating prices, which have risen from less than $10/Gcal in 1997 to almost $24/Gcal in 2002, are already higher than the limit of affordability for many of their customers, who are increasingly disconnecting from the system or simply refusing to pay.

[38] The 'social tariff' is described in detail in Chapter 5 of this report.

a. Metering and Low-Income Consumers

As the share of heating in the monthly budget of a low-income household in Romania is abnormally high, in some cases the bill can exceed total household income. For example, a typical monthly pension in the winter of 2001/2002 was 1.5 millions of ROL (MROL)($50 approximately), whereas a fixed household charge during the winter (heat, hot water, cold water, building services) could be more than 2 MROL. A common thread of discussion amongst low -income households during the summer of 2002, was worry over how to cope with heating bills for the coming winter.

The incentive for low-income consumers to reduce their heat and hot water consumption through the introduction of individual metering and control cannot be overstressed. This measure alone could move a large part of the Romanian population from below the poverty line to above the poverty line.

b. Attitude of District Heating Companies

Romanian district heating companies face a dilemma. On the one hand, as monopolists they recognize the potential of household-level metering and control technologies to substantially reduce the demand for heat, hence lowering revenue; thus, there is an economic incentive to oppose the introduction of these technologies. On the other hand, a vicious cycle of customer disconnection, non-payment, and rising costs is threatening their sustainability, and metering and control technologies represents a way of slowing or even reversing this trend.

There is no universally accepted view; even within district heating companies opinions diverge widely, with some individuals embracing and promoting the introduction of household-level metering and control, even as others oppose, resist, and undermine. While this issue is ultimately a matter for households and owners associations, attitudes of district heating companies influence their decisions.

A Case Involving RADET

RADET has noted that full agreement by all households within a building is currently required in order to introduce heat cost allocators (HCAs). When the Foundation for Civic Action (FCA), a non-governmental organization that installs hot and cold water meters in households, to install HCAs, it found it impossible to achieve consensus for an entire building. Thus, a large-scale HCA program would clearly be impractical without a change to the legislation.

Meetings between the consultant team and individuals from RADET resulted in conflicting signals about the company's view on household-level metering.

One RADET representative repeated the commonly held misconception that if 70 percent of households install HCAs, the other 30 percent "share the losses." This, however, is incorrect. The 30 percent amalgamate the losses of the 30 percent, but they do not absorb all the losses of the entire 100 percent, as a HCA-based accounting system takes losses into account. Although this is a common misunderstanding, it is one that discourages the use of HCAs and is surprising to hear from RADET.

Another RADET representative strongly favored the most-expensive HCA technology ($35 per radiator). This view discourages large-scale adoption of HCA-based solutions, as it more than doubles the capital hurdle (an standard electronic HCA costs $15).

RADET also publishes a well-designed brochure that recommends the introduction of TRV/HCA technologies, summarizing their benefits as a way to save up to 30 percent of heat consumption and claiming a payback of 6 to 18 months; the brochure quotes the typical cost of HCA/TRV bundles using electronic HCAs for an apartment with four radiators as DM 250 ($128), including labor costs. The brochure clearly favors this technical solution.

Another RADET expert noted that the company should support any technology that reduces heat demand, as the system cannot meet peak demand when the temperature falls to minus 10 degrees (Celcius).

Essentially, RADET sent mixed and confusing signals, which is consistent with signals observed when discussing this issue with district heating stakeholders in other countries.

3. Basement Heat Meters

According to Danfoss (a Danish energy technology company with a strong presence in Romania), the installation of a basement heat meter in Bucharest can reduce a building's heat bill by up to 30 percent. That particular figure represents no real energy saving because the methodology used by the district heating company to calculate consumption typically over-estimates by 30 percent; thus, the customer is over-charged by 30 percent.

The recent introduction of some basement meters in Bucharest has demonstrated[39] that metered buildings typically consume 22.5 less than calculated consumption. In early 2003, RADET's new president announced that unmetered buildings would be charged the same as similar metered buildings.

Although mandatory basement heat metering was introduced in 2002, there is no timetable or financing for installing such meters nationally. The government recommends HCAs but has no plans for financing or enabling their introduction, nor any for making their use mandatory. The legal problem of how to deal with households that challenge the validity of HCA methodologies has not been adequately addressed at a national level.

In the metering arena, the government appears to have done too little, too late. The logical steps are to provide heat metering and autonomous control for district-heated households and then to raise prices to market levels, encouraging households to regulate their heat consumption, invest in energy efficiency, and consume heat within their household budget. As these technologies are not yet in place, the substantially

[39] Source: 'Capital', 6th March 2003.

higher heating prices for the winter of 2002/2003 were expected to be unaffordable to many households, feeding the spiral of disconnection and non-payment that may lead to the collapse of more heat companies.

4. Extent of Metering and Control in Romania

a. Electricity

All Romanian households are metered, normally with single-phase single rate meters. The very few households who choose the day-night tariff have dual-rate meters. Households pay the full cost of the meter, which is reimbursed through deductions from the electricity bill until the payment has been recovered. ANRE does not get involved in this, and there are no specific regulatory rules. This is potentially discriminatory against low-income households that may be unable to afford the up-front cost of installation, but at present this is not an issue as the multi-rate household electricity tariff is extremely unattractive for most households (see Chapter 5).

b. Heat

The incidence[40] of basement heat meters varies widely, from 90 percent of buildings in western counties to 30 percent in eastern counties, and 25 percent in Bucharest.

A recent legal requirement to install basement heat meters reflects increasingly widespread acceptance that metering on a national scale is an essential first step toward a rational pricing policy, energy efficiency, and sustainability for the district heating networks.

Utilities complain that they have no money to carry out this work, and the new legislation may not be widely respected. There is a precedent for this: a previous legal requirement to meter buildings and apartments was simply ignored by both utilities and the public.

Moreover, it is generally accepted that more of the district heating companies may collapse as a result of non-payment and disconnection, so in this context, there is little point in creating a legal requirement to invest in a failing system.

Still, some better-informed (typically richer) owners associations are themselves fronting the money to install meters, recognizing this to be in their financial interest.[41] Money is taken from the owners' maintenance fund and reimbursed by the district heating company within three months. This is a low-risk option for owners associations, who could deduct the sum from the heat bill if the heat company defaults.

(1) Size of the market. According to Danfoss, the cost of basement rehabilitation work and metering every apartment building in Romania, including financing, management costs, controls in the basement, and labor, could approach $100 million. A meter for a large apartment building (50-400 apartments) can cost $500 to $1,000, plus the same again for installation. Two are required for each staircase (for heating water and

[40] Sources: FCA for country estimates; RADET for Bucharest estimate (April 2002).

[41] Source: interview with RADET

washing water). Some 12,500 district-heated staircases in Romania do not have these technologies in place.

(2) EU investment. The EU is planning a 5 million EURO[42] (MEURO), "Energy Efficiency in District Heated Housing," under the EU PHARE 2001 budget (for implementation 2003/04), and at least 5 MEURO under the 2003 budget (for implementation 2005/06).

The project will involve installing HCAs and TRVs throughout 350 apartment buildings in four cities, to be selected from a shortlist of six cities. According to ARCE, the project has been approved in Brussels and consultants Cowi of Denmark, who designed the project, are preparing the tender.

Originally, the Cowi plan was to fit 30 thousand apartments with HCA/TRV bundles; the current plan calls for 15 thousand apartments to receive both HCA/TRV bundles and volumetric meters for both hot and cold water. Cowi recommended a cost-benefit analysis, as it may be better to stick to the original plan.

ARCE's original calculation was $100/apartment x 40 thousand households = $4 million, but they are now assuming $200 to $250 per apartment. A survey to measure the impact of the project will be carried out at the same time.

An issue yet to be resolved is whether the beneficiary buildings should be from the areas where the EBRD has already financed rehabilitation of the supply side.

c. HCAs

At the apartment level, HCAs are installed in some buildings, with the incidence varying from town to town. Evaporators are more common than digital HCAs, but for new installations electronic HCAs are now preferred. A number of companies, including Honeywell, Techem, Siemens, and Viterra, sell HCA/TRV bundles in Romania.

According to Danfoss, customers are district heating companies, who are the preferred customers as they place bigger orders, or owners associations, typically from richer blocks that have relatively little difficulty getting residents to agree to installation.

Honeywell, a U.S. company with a strong presence in Romania, reported there to be 2.3 million apartments in Romania, so the value of the HCA/TRV market is in the range $184 million to $288 million.

(1) Legal framework for use of HCAs. Although a government ordinance recommends the use of HCAs, it does not make them mandatory. Secondary legislation (norms) to accompany this legislation may or may not solve the issue of how to allocate heat to non-participating households.

As the legal regime has not been changed to accommodate the emergence of HCA technologies, their use can be challenged in the courts. As a result, Owners associations can and do refuse to accept their validity. A single dissenting household

[42] For the purposes of this report, it is reasonable to assume USD/Euro parity

that refuses to install HCAs has the legal right to insist that heat costs be allocated to all households the "old way," that is, equally, according to the size of the apartment. Hence, in the current legal environment, HCAs can be used only if 100 percent of households in a building agree — a level of consensus not possible to achieve on a large scale.

This problem closely mirrors an earlier problem, overcome by revising norms, of owners associations refusing to accept the readings of household water meters.

(2) Cost. Honeywell Romania puts the cost for installing HCA/TRV bundles at $20-$25 per radiator, including labor. Typically, there are four or five radiators per apartment, so it costs from $80 to $125 per apartment to fit the bundles.

Danfoss Romania provided the following costs per radiator for HCA/TRV bundles: $15 for a TRV, $15 for an electronic HCA with ten-year battery, $1.5 for installation, and $5 for an evaporator whose evaporating liquid must be replaced annually ($1).

(3) Complications and needs. According to the EBRD, the major financial institutions recognize that HCA/TRVs can be a better investment than supply-side rehabilitation, but internal networks in buildings are owned by the residents, who are not party to district heating loan agreements.

(4) Competing HCA technologies cause additional complications. There are two basic alternative technologies: analog and digital.

Analogue HCAs, also known as evaporators, feature an ampoule of evaporating liquid that can be read from a printed scale (rather like a traditional thermometer). This lower-cost technology has been available for several years. The analog HCAs are a cheap, well-known, and proven technology; their disadvantages are that they have a reputation for being inaccurate and "easy to cheat." Although some manufacturers claim to have resolved these issues several years ago, the reputation has stuck.

Digital HCAs, also known as electronic HCAs, come in several models that range from simple $15 models to sophisticated $35 units with infra-red or radio-based reporting features. They are accurate, cannot be cheated, offer advanced features, and require a new battery every ten years; their disadvantage against evaporators is the higher capital cost.

In addition, there also are competing brands. The often contradictory views of the suppliers, district heating companies, "experts," and other stakeholders on the merits of the two technologies and the several brands exacerbates households' difficulty of achieving consensus. Consensus is essential because, for technical reasons, each radiator in a building must be fitted with exactly the same model of HCA.

Both the EBRD and Honeywell suggest a need for an information campaign to describe to the Romanians the benefits of metering and HCA/TRV. Experience in neighboring Bulgaria suggests that running such information campaigns through, or in close collaboration with, the district heating companies is the most-effective approach.

d. Metering and Control of Hot and Cold Water

An FCA study[43] has demonstrated that a continuously dripping water tap wastes around 2,650 liters per month and that a continuously running toilet wastes around 29,000 liters per month.

In Bucharest, typical domestic water consumption ranges from 500-600 liters/person/day to 800-900 liters/person/day in some areas, whereas according to standardized values, it should be only 280/liters/person/day. FCA cites “irrational consumption” (incorrect price signals) and leaking taps and toilets as the causes for this discrepancy.

At the building level utilities can be reluctant to install water meters, which typically demonstrate lower consumption than previously calculated, lowering utility revenue.

In February 2002, Bucharest municipality decided that Apa Nova (the water utility) and RADET (the heat utility) must install basement meters throughout the capital, which is expected to happen over a period of around three years.

Romanian apartment buildings are typically constructed using the vertical water pipe system, so the pipes leading to a bathroom are connected to the bathrooms in the apartments above and below but not to the kitchen in the same apartment. As a result, households that wish to install individual volumetric meters for hot and cold water at the apartment level must fit four meters (two in the bathroom, two in the kitchen) rather than two. Legislation discussed in 2002 may include a ban on vertical hot and cold water systems for new buildings.

(1) OA resistance. Cold water and hot water utilities bill owners associations, who collect money from each apartment based on the number of occupants and then pay the utility. The first households that installed individual meters typically recorded much lower consumption than their share when calculated using the old methodology.

Some OAs considered metering to be undesirable, as it increases the (relative) amount payable by the households without meters and complicates the task of billing. Many refused to acknowledge meter readings, continuing to bill the “old” way. Litigation was commonplace until Government Ordinance 78/2001 created norms forcing OAs to respect metered water readings; this, in the words of one commentator from RADET, caused an explosion of demand for hot and cold water meters.

(2) Recent metering legislation. General primary legislation is qualified by secondary legislation (government ordinance) and further qualified by detailed municipal legislation (municipal decision), so the extent of understanding and commitment at local government level is key.

Bucharest Municipality appears to be committed to widening the introduction of metering, having created (February 2002) a regime that certainly enables and perhaps

[43] 'Study on individual measurement and rationalization of cold and warm domestic water consumption', Foundation for Civic Action.

requires metering of heat, hot water, and cold water down to the apartment level. However, as no specific dates are attached to the metering requirements, it remains to be seen how effective the new regime will be.

Government Decision (HG) 90 of 1991 required industrial consumers to meter all forms of energy, but this was largely ignored and abrogated in 1995. More legislation followed: HG 348 of 1993 required household-level heat metering but was ignored by both utilities and households; the Energy Efficiency Law of 1999 empowers ARCE to develop norms; HG 29 of 2000 on Technical Rehabilitation of Buildings prevents unmetered apartments from being bought and sold from 2005, on; HG 78 of 2001 forces water-meter readings to be respected and apparently makes other forms of household metering mandatory, but is ambiguous, has no time limit, and contains no sanctions for non-compliance; Bucharest City Municipal Decision 41 of 2002 clearly makes the introduction of household-level heat and water metering mandatory in the capital; and HG 73 of August 2002 makes basement heat metering mandatory and recommends household-level heat and water metering. Appendix 4.3 contains a more-detailed review of these legislative acts.

e. Gas Metering and Control

There are two broad categories of natural gas: “cooking” gas and “heating” gas.

Cooking gas is natural gas supplied via a 0.5 inch vertical pipe to every kitchen in an apartment block. It is normally considered impractical and uneconomic to individually meter cooking gas, which is normally metered at the level of the building. As incremental gas use is very cheap for a household (the bill shared among neighbors), lighting the cooker rings on cold days to keep the kitchen warm is very common.

During the early 1990s, a few apartment owners installed other heating/hot water appliances on the cooking gas system. Although banned since 1993, the few systems installed from 1990 to 1993 are technically legal [retrospective legislation is unconstitutional]. Other households have since installed illegal gas appliances.

Neither the legal nor the illegal variations are very common because gas costs are passed on to the neighbors, who find out and take action. Moreover, both variations can be dangerous, as ventilation is typically inadequate and, as there is no tradition of small-scale apartment-level natural gas heating, the work is typically carried out by plumbers rather than gas fitters.

Heating gas is officially available to individual households, including those living in district-heated buildings who wish to disconnect from the system and install their own heating solution. Distrigaz installs a separate 0.75 inch (diameter) pipe and meters such apartments.

E. Policies, Laws, Projects, Programs, and Organizations

1. Policies

Although there is no single overt statement of national energy-efficiency policy, it is possible to derive major principles from the “National Medium-Term Strategy for Energy

Development of Romania, 2001-2004" (Government Decision 647/2001), a "Long-Term Energy Strategy for Romania for 2002 -2015," and the "Energy Efficiency Law" (Law 99/2000), which passes responsibility for drafting energy-efficiency policy to ARCE on behalf of the Ministry of Industry and Resources.

Although ARCE is aware of and strives to deal with energy-efficiency issues that involve sectors other than industry, the position of the agency as subordinate to the industry ministry represents a lack of real authority to act in other sectors. In this context, the role of ARCE in many sectors is necessarily advisory rather than one of an authority.

2. Laws

Supply-driven rather than demand-driven, the Energy Efficiency Law does not directly affect households or other end-users. Although ANRE had legal responsibilities to promote energy efficiency through the Energy Law (Ordinance 63/1998), these responsibilities were transferred to ARCE by the Energy Efficiency Law of 2000. According to ANRE, this was a step backwards.

ARCE's president believed there to be too many actors in energy efficiency, all with their own policies. Short-term goals for the agency included promulgation of a new energy-efficiency law to incorporate provisions for funding the agency and development of a single energy-efficiency policy for all sectors[44].

Government Ordinance 29/2000 on thermal rehabilitation of buildings sets up a national rehabilitation program under the Ministry of Public Works, Transport and Housing. No central government funds are available. Funds from local and country budgets, consumers, ESCOs, and heat suppliers are envisaged.

Improvements in the legal regime for energy audits and energy management were set in November 2002. Official Journal (OJ) 836 of 13 November 2002 contains a regulation on authorizing energy audits and certifying individuals and companies as energy managers, and OJ 837 of 20 November 2002 sets the methodology for the certification of energy auditors in buildings[45].

3. Programs and Projects

Since the early 1990s, bilaterally and multilaterally funded donors, such as USAID, EU, and others, have been running programs that include energy-efficiency activities. Typically, ARCE represents the government and chairs project Steering Committees.

Although several projects have focused on the household sector, none have specifically focused upon low-income households. Some projects, however, have addressed such low-income/disadvantaged groups as children's homes, hospitals, and schools. Projects are reviewed briefly below and in more detail in Appendix 4.4.

[44] Source: interview, April 2002.

[45] Source: APER Info Romania, No.71, November 2002.

A number of supply-side district heating demonstration projects that included weatherization and demand-side metering and control as a small component of the larger project are excluded from this review. These do not demonstrate the impact of the demand-side measures well, as it is not possible to determine which savings result from supply-side rehabilitation and which as a result from the demand-side investments.

a. Household Projects

- *Energy Savings in Brasov.* Danish Energy Agency
- *Energy Savings in Buildings,* EU PHARE 1992. Programme and NOVEM
- *District Heating Improvement Study in Bucharest. EU PHARE [which ultimately led to the European Investment Bank's loan for metering RADET]*
- *Heating Rehabilitation: The Impact of Metering in the City of Sibiu.* ADEME of France
- *Modernization of District Heating Systems and Buildings Insulation.* EU PHARE.

b. Projects in Schools, Hospitals, and Social Institutions

- *Installing CFLs in Budgetary Institutions: a DSM Action.* RENEL in 1998; contains good data on costs and impact
- *Thermal Rehabilitation of Housing Buildings at the University of Iasi.* EU Ecos-Ouverture Urban and Regional Energy Efficiency Programme
- *Energy Use and Savings in Schools* [demonstrated energy-efficiency measures in four schools; contains useful cost-benefit data]
- *Energy Audits and Buildings in the Tertiary Sector.* EU PHARE [audit reports for each of eight buildings]
- *Energy Efficiency in the Health Sector.* EU PHARE [demonstrated the scope for energy conservation in hospitals and contains good cost-benefit data]
- *Energy Efficiency in Institutions.* EU PHARE [a component of a wider project carried out to improve energy efficiency in social institutions such as orphanages]

c. Labeling

- *Legal Framework and Regulations for Standardization and Labeling of Energy Performances of Household Appliances.* EU PHARE [led to a substantial improvement in the efficiency of refrigerators and other appliances for sale]
- *Energy-Efficiency Labeling of Buildings* [will be introduced in Romania from 2005]

d. Information, Awareness, and Education

- *Energy Efficiency Law* project. USAID and World Learning; implemented by APER [led to the adoption of the Energy Efficiency Law (Law 199/2000)]
- *Compact Fluorescent Lamps (CFL) Awareness* [demonstrated the "bill-stuffers" model, but the model has not taken hold in Romania]
- *Catalogue of Metering Equipment* [pilot project designed to improve ARCE's institutional capacity in the early 1990s]
- *Energy Cities Network.* EU PHARE 1992 Energy Programme
- *Nationwide Energy Efficiency Awareness Campaign* [visible while it lasted, but as a one-time initiative may not have made a lasting impact]
- *Masters Degree in Energy Auditing.* UNESCO [launched at Bucharest Politehnica University in the academic year 2002-03]

e. Metering

- *Botosani HCA/TRV* [demonstrated that HCA/TRVs reduce heat consumption by 30 percent, with some households saving even more]
- *Foundation for Civic Action.* [failed to install HCAs, demonstrating that clear legislation is-a pre-condition to widespread introduction of metering and control]
- *HCA/TRVs in Five Towns.* EU PHARE [will install HCA/TRVs in five towns in 2004 and carry out a follow-up project in 2006, combined value 10 MEURO]

f. Market Stimulation

- *Energy-Efficiency Market Development Program 1994 – 1996.* USAID [training for ESCOs, some of which are still active in 2003]
- *Energy Efficiency Projects Selection Technical Assistance.* USAID [assessed the financial viability of seventeen municipal energy efficiency projects, as described at www.dec.org]

g. Energy Policy and Price Reform

- *Energy-Efficiency Price Reform.* USAID [early project often considered to represent the turning point at which time Romania began to introduce a rational energy-pricing policy]
- *High-Level Energy Policy and Legislation Advisor to Romania.* EU SYNERGY Project [built Romania's capacity to start the long road to meeting the energy sector requirements of EU membership]

4. Energy-Efficiency Organizations

Although Romania features several energy-efficiency organizations, only those of specific relevance to household issues are reviewed here.

a. Owners Associations (OA)

[Note: The term *condominium association* is avoided, as it has several shades of meaning.]

Legislation in the early 1990s led to many households owning their apartments and jointly owning both communal areas and the land beneath the building.

Before the political changes of 1989, there was already a system in place whereby someone from each apartment block took responsibility for communal issues; thus, the establishment of OAs was a seamless transition involving a meeting of households and a show of hands, with the administrators carrying on their existing role but now as elected representatives of the owners. The role includes collecting money to pay household utility bills — district heating, water, garbage collection, etc. [OAs now even coordinate HAP, as described in Chapter 3.]

Typical OAs feature an elected committee, a salaried cashier, a part-time accountant, and perhaps other staff members, depending on the size of the building. Committees often consist of retired persons living in the building, and the staff also are almost invariably retired householders. Laws define their roles and responsibilities.

OAs are a considerable civic resource for Romania, a point sometimes missed in Romania itself, where their role is seen as “normal.” However, in some other countries of the region, households have to pay for services, such as water, district heating, and garbage collection, on an individual basis; in others, nobody takes responsibility for cleaning and maintenance; in still others, associations are undemocratic and/or corrupt.

b. Romanian Federation of Property Owners (RFPA)

RFPA lobbies for better conditions for district heating consumers, and is critical of the approach of both ANRE and particularly of RADET[46]. In a surprise move at the beginning of 2003, in response to a very cold winter, high district-heating prices, and allegations of mismanagement at RADET[47], the head of RFPA (Radu Opaina) was appointed head of RADET.

Opaina planned substantial changes at RADET and aimed to install basement heat meters throughout the capital by the beginning of winter 2003/2004. This was generally considered an overly optimistic target considering the large amount of work involved. However, Opaina left RADET after only a few months and returned to RFPA.

c. Foundation for Civic Action and the “OA School”

A Bucharest-based NGO, the Foundation for Civic Action (FAC), works on a number of energy-related low-income issues.

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[46] Source: "Objective of the Federation: a Cheaper Gigacalorie", Dumitru Gherdan, Federation of the Association of Property Owners in Romania, 2002.

[47] It was widely reported in the press that RADET invested two-and-a-half times more in a new sports center for employees and the mobile phone bill than investment in the heat network during 2002.

FAC and the Ministry of Public Administration have developed a ten-day training course for building administrators that is known locally as the school for administrators. This course leads to a formal certificate. Although the course is actually run and financed by FAC, the ministry provides the certificate to make it seem more official. The objective of the course is to raise the competence and profile of OA staff, who can sometimes be held in low regard by the households they represent. Topics address ways to lower costs through weatherization; how to install meters and controls; and ways to finance and implement such projects.

Although there is no requirement that an OA representative hold a certificate, the initiative has proven popular with some administrators, as the burden and complexity of responsibility for running a building, as well as the sums of money involved, have risen progressively during the last decade. Of course, there are also administrators who believe they have nothing to learn.

Other FAC activities, such as its work on demonstrating the impact of hot- and cold-water metering, are reviewed elsewhere in this report.

d. Municipalities, MUNEE, ASE, and APER

The Municipal Energy Efficiency Network (MUNEE) is a USAID- and UNECE-funded program running in several countries of the CEE/Eurasian region. The Network is run by ASE, and the regional partner for Romania is APER.

According to APER's executive director, the basic problem MUNEE is seeking to address is that neither mayors, nor utilities, nor households have a good understanding of energy-efficiency issues.

APER/MUNEE has built a network of 63 energy-efficiency "champions" from 42 municipalities in Romania. These individuals represent various levels of responsibility, from engineers to decision-makers, but all sharing a common interest in energy efficiency. Members also include some individuals working at the national level, such as Marin Cojoc of the Department for Budgeting Municipalities of the Ministry of Finance.

The MUNEE focus in Romania is on defining the energy situation in municipalities — especially for district heating and hot water — in order to sensitize decision-makers. A strong emphasis is put on removing legal barriers that prevent municipalities from using their own budgets to co-finance energy-efficiency investments.

APER carried out a MUNEE-funded training program for municipal energy-efficiency stakeholders during 2002, covering a wide range of topics including cogeneration, monitoring and controls, meters and heat cost allocators, and financing. Other activities included a tour of 16 municipalities to monitor energy-efficiency progress [a report is available] and the establishment of two pilot energy-efficiency offices with municipalities.

e. ESCOs

Engineering companies that specialize in the energy sector in Romania generally do so on a straightforward fee-for-service basis. Two companies now offer to install and manage energy-efficiency equipment using their own capital and then are paid on a

shared-savings basis, but neither has so far succeeded in getting this model to work in Romania.

The Romanian American Enterprise Fund, for example, has taken out a loan of $11 million dollars from the EBRD to develop CHP projects, so the first shared-savings-based projects are expected in 2003/2004. Clients are expected to be from the private sector rather than municipal or household sectors.

Energy Serv — the other ESCO that wants to do shared-saving-based business — is not targeting the municipal or household sectors at this time.

f. The Romanian Energy Conservation Agency

ARCE is the oldest central and eastern European national energy-efficiency agency, having been set up in the early 1990s under the ministry then responsible for industry. The agency has downsized in recent years and currently employs 35 staff, of which 12 are at headquarters in Bucharest and 22 are in eight local branches.

ARCE's subordinate position to successive industry ministries has limited its scope to be effective in other sectors such as buildings and transport. The agency is involved in household energy-efficiency issues to some extent, but mainly in an advisory capacity.

Official Gazette 693 of 11th September 2001 contains details of a Government Decision modernizing the rules of organization and operation of ARCE.

g. Four Energy-Related Regulatory Authorities

Four authorities regulate different parts of the energy sector: ANRE for electricity and heat; ANRGN for natural gas; ANRM for oil, upstream gas, and mineral resources; and the recently established ANRSC for public services.

ANRE's responsibility for demand-side energy efficiency has been removed, as the Energy Efficiency Act of 2000 transferred a number of such attributions to ARCE. More recently, ANRE transferred its responsibilities for household-level energy efficiency to ANRSC by inter-authority protocol.

h. Effect of Disconnection on Energy Efficiency

District heating is inherently energy efficient, subject to three provisos: good design, good management, and a predictable heat load. The first two elements were absent in 1989, as the communist-era approach was to design and run networks on an ad-hoc basis without regard for system efficiency. Opportunities to correct these deficiencies during the 1990s were few as a result of low energy prices, low availability of finance, unpredictable policies, and a sharp reduction of industrial heat load. Some of these barriers have now been lowered or overcome, but declining residential heat load has emerged as the new barrier to recovery. Household disconnection, whether as a result of non-affordability or the desire to install an individual heating system, undermines recovery of district heating companies. The lack of a stable customer base is likely to lead to the permanent financial collapse of more district heating networks.

According to Danfoss[48], the Government has only recently realized the seriousness of the problem of disconnection, and that it represents a real threat to the financial sustainability of district heating. It is understood that the IMF alerted the Government to this problem, and is pressing for installation heat meters in every basement as a step towards a sustainable solution.

5. Impact of Disconnection on Low-income Consumers Who Do Not Disconnect

Low-income customers who choose to stay connected to communal heating network are adversely affected by their neighbors' disconnection - always and progressively in the case of decentralized heating systems, and sometimes and suddenly in the case of district heating. This is because the efficiency of any form of central heating lowers when individuals disconnect, so the relative costs of running the system increase for the remaining consumers.

If an apartment disconnects from a decentralized system (boiler in the basement), heat costs rise for the other apartments. For example, in central Bucharest two 50-unit apartment buildings share a central boiler that dates from 1938. Fifteen (wealthier) households collaborated on the installation of a separate gas supply, disconnected from the old boiler system, and installed individual heating solutions. Now, maintenance and running costs for the old boiler are split between 85 households, rather than 100.[49] The logical next steps are that more households will choose to disconnect, further driving up costs for the remaining apartments, until the few remaining households cannot support the costs and are left with no heating source.

For district heating networks, the principle is the same but the practical impact is different. The subsidy that supports the NRP shields household customers from noticing progressively rising costs as their neighbors disconnect. However, once a critical mass of households disconnect, the entire system becomes financially unsustainable and collapses, leaving the remaining customers with no heating source, as happened for the 72 networks that have collapsed so far.

The EBRD noted that the Minister of Industry and Resources had made a public declaration that reconnection would be free of charge for customers choosing to return to the district heating system. Although this is an excellent idea, few households are likely to accept this offer because the conditions that led households to disconnect in the first place have not yet been adequately addressed.

6. Zoning and Competition Between Natural Gas and District Heating

"Zoning," in the context of this report, typically means banning the use of individual heating solutions in buildings served by centralized or decentralized heat networks. It is a commonly used and effective solution that is applied in countries such as Denmark and Hungary, where use of district heating in district-heated buildings is mandatory, so

[48] Source: interview, April 2002.

[49] Boteanu Street.

disconnection is not an issue. Romania generally does not apply this solution, which is considered a municipal issue rather than a national issue.

Zoning is not as straightforward a concept as it appears. In the period since 1989, district-heating networks have frequently provided inadequate heating; many still do. It would have been unreasonable to deny households the right to opt out from bad service in order to keep warm. Some heating companies have now improved, but for others the only discernable difference in recent years is that the utility now provides its bad service at a higher price.

Suppliers of natural gas and natural-gas-fired appliances capitalize on the lax approach of municipalities on zoning and the weaknesses of some of the district heating networks to capture new customers, which exacerbates the problem of disconnection from centralized heating networks. An estimated 65,000 individual gas-heating systems for households had been installed in the southern part of Romania alone by the beginning of 2002, and in some medium-sized cities over 50 percent of apartments are now heated by individual units[50].

F. Impact of Energy Efficiency

1. Reducing Poverty Levels

Low-income households that control and pay for their own heating costs tend to heat one room only and turn the heat off when there is nobody at home. By adopting this approach, households that benefit from HAP can generally meet their heating bills.

Low-income households that cannot control their own heating costs and must pay whatever the building or district heating company chooses to supply have little incentive to invest in improving the energy efficiency of their homes. For HAP recipients with average heating bills, heating costs are covered and there is no economic incentive to attempt to reduce costs. In low-income households that are receiving a lower level of HAP, or do not meet the eligibility criteria, or have higher than average heating bills, the usual approach is to reduce the number of radiators and hence pay less for heat, disconnect from the centralized system entirely, or refuse to pay.

Low-income and higher-income households that are connected to the cooking-gas system frequently light their cooker rings to provide “free” heat in the kitchen on cold days.

2. Barriers to Utility Privatization

As Romanians generally do not use electricity for winter heating, electricity bills are affordable. Low-income households do not represent a barrier to the privatization of the power distribution utilities in this respect.

As power generator Termoelectrica is also the largest supplier of heat for the district heating sector, the problems of non-payment resulting from poor performance of the

[50] Source: Energy Charter Secretariat, PEEREA report on Romania (draft), 2002.

district heating sector may be considered to represent a barrier to privatization of the power-generation sector.

Chapter 5
Energy Prices and Tariffs

The Government of Romania and the IMF are in the midst of a determined effort to raise energy prices to market levels quickly. For example, between June 2001 and June 2002, household gas prices increased by 116 percent, electricity prices by 47 percent, and heating prices by 71 percent, with an additional 33 percent becoming effective in August 2002. The extent of recent and planned price rises is detailed in Appendix 5.1.

A. Electricity Prices and Tariffs

1. Evolution of Average Electricity Prices in Romania

Average household electricity prices in Romania have risen substantially in the last decade or so, from a low of 0.3 cents/kWh at the end of 1991 to 5.9c/kWh in July 2002.

A key principle of Romanian electricity pricing is that for all categories of tariff customer[51], tariff options are and will remain exactly the same everywhere in the country. USAID is planning to fund a study to modernize the commercial code to create a balancing mechanism that will allow this policy to continue in the environment of combined private and public generators and distributors.

A pivotal point in the price evolution occurred in June 1999, when for the first time household energy prices became higher than industrial prices. Another pivotal point was April 10, 2002, when end-user prices rose 14 percent and Termoelectrica upped the producer price to $0.039/kWh. These increases led, for the first time, to full cost recovery for the power sector.

Monthly household electricity prices from 1991 to 2002 are provided in ROL and USD as Appendix 5.2 and Appendix 5.3.

2. Household Electricity Tariffs 2002 and 2003

Since ANRE's establishment, Romania has successfully introduced an elective tariff system for households featuring five distinct tariff options. The tariffs and rates from July 1st 2002 are described in the following table:

[51] Tariff customers include all residential and commercial customers and smaller industries. There is a market for power for large industrial consumers.

Tariff		Tariff name	Description and rate (ROL) (July 2002)	US cents*	Chosen by percent
1	CS	The social tariff (inverted block tariff)	A two-tier inverted tariff with a 60 kWh threshold and commodity charges of: 1,339 ROL/kWh below the threshold 5,759 ROL/kWh above the threshold	 4.1 17.5	44.1 percent
2	CD	Straight commodity charge tariff	2,840 ROL/kWh	8.6	7.7 percent
3	CA	Standard Tariff with Capacity charge + commodity charge	Capacity charge of 1,044 ROL/day Commodity charge of 2,106 ROL/kWh	3.2 6.4	47.9 percent
4	CA 2	Two time zone tariff	Capacity charge of 1,044 ROL/day Commodity charges of 2,560 ROL/kWh daytime rate 1,662 ROL/kWh nighttime rate	3.2 7.8 5.0	0.2 percent
5	CA 3	Three time zone tariff	Capacity charge 1,044 ROL/day Commodity charges of 4,212 peak rate 2,106 ROL/kWh daytime rate 1,662 ROL/kWh nighttime rate	3.2 12.8 6.4 5.0	0.0 percent

*Exchange rate applied: $1: 33,000 ROL.

The above prices were adjusted in December 2002 to take into account the declining value of ROL to USD, but when expressed in dollars, tariffs at the beginning of 2003 were unchanged from those described above. Details are provided in Appendix 5.4.

According to Electrica, customers were informed about tariff choices through a mass media campaign and conferences in 2000. Every major change to the tariff is accompanied by a new media campaign. Tariffs are also published at electricity payment centers.

When elective tariffs were first introduced, there was a six- to twelve-month grace period in which consumers could switch between tariffs. Customers are now allowed to switch tariffs only every 12 months although households may switch to the social tariff at any time.

3. The Social Tariff (Tariff CS)

As noted, the social tariff features low-cost electricity for the first 60 kWh/month; above that level electricity becomes more than four times higher, providing a strong economic incentive for households to keep monthly consumption below the threshold.

Forty-four percent of residential consumers choose this tariff, and 95 percent of these consumers manage to keep consumption below the threshold (as of mid-2002). At the end of 2000, when the threshold was only 50 kWh/month, only 22 percent[52] of households elected for the tariff, but this number has risen progressively since then.

According to Electrica, low-income consumers tend to choose the social tariff and make a real effort to remain under the threshold. Many low-income households — particularly in rural areas — do not own a refrigerator, so remaining below the threshold is not difficult.

Because the social tariff is elective, capture is high and there are no targeting costs. Targeting is imperfect, however, as richer households can choose the tariff and invest in highly efficient appliances to keep consumption below the threshold. This also may be considered to be a good side-effect of the tariff. Vacation homeowners typically choose the social tariff, too, which is generally accepted to be an imperfection of too small a scale to be important.

Some customers who consume below the threshold choose the standard tariff anyway, as they are uncertain about their future consumption pattern.

The decision to increase the threshold from 50 kWh to 60 kWh/month was a political decision, not an initiative by the regulator (although it was put through the regulator). In common with many regulators in the region, the regulatory authority is independent only to the extent that it chooses to do what the government wants. According to Electrica, the decision to increase the threshold to 60 kWh was an unwelcome surprise that will raise the cost of operating the tariff to $60 million per year. The average household monthly electricity consumption in Romania is around 85 kWh.

A detailed analysis of data provided by Electrica for the month of June 2002 revealed an average monthly consumption for social tariff households of only 30 kWh, which is extremely low. We double-checked this data with Electrica, who confirmed it to be correct.

Electrica hypothesized that there are three reasons for the low consumption levels: first, because June is a summer month the lighting load is low; second, the statistics are for customers, not consumers, and some social tariff customers — perhaps as many as 20 percent — are vacation homes or empty households, so there are frequent periods of no consumption at all; third, in rural areas households can consume as little as 10 kWh/month, owning perhaps one or two lamps but no other electrical appliances.

[52] Source: 'Low-income customers - meeting their needs' presented at the Fourth Annual Energy Regulatory Conference for C&E Europe and Eurasia in 2000.

Several features of the Romanian social tariff are examples of best practice. The low threshold of 60 kWh/month means that the overall cost of the tariff, when calculated on a per-household basis, is also low. The tariff is optional, which represents a very low cost and effective form of self-targeting. Coverage of the poor is high while also avoiding penalizing low-income households with high power requirements, which can be a criticism of some targeting mechanisms when applied to inverted block tariffs.

Although targeting is imperfect, the social tariff does provide an incentive for non-poor households to be aggressively energy efficient in order to benefit from the tariff, which represents desired behavior. Consumption above the threshold is extremely costly, so there is a strong economic incentive for only households with very low power requirements to choose this tariff, and then to monitor their electricity use carefully and save energy in order to consume within the limit. The cost of the tariff is carried within the household sector, which is better than being cross-subsidized between the household sector and the industrial sector or, worse still, as a loss for the power company. However, the subsidy shouldn't really be carried by the power sector at all.

Other features of the social tariff do not represent good practice. The main criticism is that it is an example of the power sector being used to shoulder the cost of social assistance. The involvement of the government in raising the threshold from 50 kWh/month to 60 kWh/month is an example of the independence of regulation “in name only” that is an undesirable feature of several regulatory regimes in central and eastern Europe and Eurasia. Reading meters every six months rather than monthly is very clearly incompatible with this form of tariff, so the choice should be made between keeping the social tariff and introducing six-month metering. A case can also be made that, as electricity is not normally used for winter heating in Romania, power would be affordable to households — even low-income households — without this subsidy, so the subsidy is arguably unnecessary in this respect. The other imperfection, the selection of the tariff by vacation homeowners, is considered de minimus, taking into account that the subsidy per household is limited, that most second-home owners are contributors to the subsidy through their main residence anyway, and that the benefits of the targeting mechanism are high.

a. Larger Low-Income Households Better Off Not Choosing the Social Tariff

One of the criticisms of inverted block tariffs is that large families that cannot keep consumption below the monthly threshold are effectively penalized by such tariffs. Romania has overcome this problem by making the tariff elective, so large low-income families tend to choose the standard tariff.

b. Self-Reporting is Possibly Incompatible with the Social Tariff

The new meter reading and collection company, Sinserv, conducted an experiment in 2002 under which the meters of 100,000 Bucharest households were read every six months rather than monthly, although the meter reader/payment collector continued to visit monthly to collect payments. Meter readings were estimated by the company or self-reported by the household. The experiment appears to demonstrate that self-reporting is incompatible with continuing to operate the social tariff for three reasons:

- Households that self-report are unlikely to report if consumption exceeds the 60 kWh/month threshold because they would pay over four times more for incremental consumption.
- Households that do not self-report typically lose track of consumption, as there is no one to tell them how closely consumption has met the threshold each month. This element of closely monitoring consumption, which is considered to be one of the factors allowing the social tariff to succeed where others have failed, is lost.
- The cumulative effect of exceeding 60 kWh/month by a little for six months can result in a gigantic bill in the sixth month, with the six-months' worth of consumption above the threshold being paid at more than four times the lower rate ($0.175/kWh rather than $0.041/kWh). The bill for underestimated consumption becomes payable immediately.

4. Straight Commodity Charge Tariff (Tariff CD)

About ten percent (7.7 %) of households choose tariff CD, which is surprising as that tariff represents poor value for money. Up to a consumption level of 82 kWh/month, tariff CS is cheaper than tariff CD, and above a consumption level of 42 kWh/month, tariff CA is cheaper than tariff CD; thus, in all cases there is a tariff representing better value than tariff CD.

5. Standard Tariff (Tariff CA)

Approximately half of households (47.9 percent) choose the standard tariff, with a daily capacity charge of 1,044 ROL and a commodity charge of 2,106 ROL/kWh. According to Electrica, the cross-over point at which the social tariff becomes more expensive to use than the 'standard tariff' is 82 kWh/month.

6. Two Time Zone Tariff (Tariff CA2)

Only 0.2 percent of households have chosen this tariff, despite the fact that dual-rate meters are available from Electrica and can be installed at no cost to the household. There are two reasons for the unpopularity of the tariff. First, electric heating is rare, so there is little demand for this tariff for night storage heating. Secondly, although night-time electricity under Tariff CA2 is more than 21 percent cheaper than the standard tariff, also daytime electricity is more than 21 percent more expensive than the standard tariff. The incentive to switch daytime consumption to night-time is simply outweighed by the premium price charged during the day.

In other countries, day-night tariffs are typically used to help the power company cut costs by flattening the diurnal load through providing an incentive for households to move certain daytime consumption to the night. This typically involves a discount for night-time consumption but not a corresponding premium over and above the standard tariff for daytime consumption. In this context, it is not surprising that Tariff CA2 is unpopular.

As day-night tariffs are a proven effective measure for flattening diurnal load in some countries, ANRE could model the impact of wider use of day-night tariffs with a view to

persuading Electrica to create more-attractive tariffs if there would be overall efficiency benefits for the entire power network.

7. Three Time-Zone Tariff (Tariff CA3)

According to Electrica, if a household requests Tariff CA3 the standard response is that the meters are not available at the present time. Meters cost around $200 each, so Electrica is not willing to buy them.

8. Pre-Payment Electricity Tariffs

One thousand pre-payment meters that use an electronic key were installed in the Black Sea resort areas for small commercial (seasonal) users and holiday homes. Although Electrica would like to extend their use to holiday cottages and poor payers and to recover debts from customers who are caught stealing power, there are no specific plans to extend the use of this technology at the present time. It is understood that customers requesting a pre-payment meter are first asked to demonstrate that they are seasonal consumers, and then later told that meters are unavailable.

There is a Romanian manufacturer of prepayment electricity meters, AEM Timisoara, which is part of the Luxten Lighting Company group.

9. Privileged Tariffs

According to Electrica, there used to be privileged electricity tariffs for staff of the electricity companies and some ministries, but this was replaced by a salary increase of the cash equivalent of 1,600 kWh/year. As the payment is not linked to actual consumption, it does not create a disincentive to save. From a legal point of view, the subsidy for retirees is included in the losses of the distribution company.

Individuals who retired before the privileged tariffs were withdrawn continue to receive a “free quota” of 1,600 kWh/year as part of their retirement package, a subsidy now on a natural decline.

10. Electricity Tariffs for Institutions (children's homes)

During the 1990s, the tariff applied to children's homes was an issue, as they were charged at the higher commercial rate rather than the lower residential rate. Now that commercial rates are lower than residential rates, the homes are happy to be treated as commercial entities by the electricity company.

B. Other Energy Prices and Tariffs

1. NRP for District Heating

District heating companies have widely diverging costs, depending upon such factors as these:

- Whether they buy heat from Termoelectrica or generate their own
- What fuel they use
- Condition of the network

However, all district-heated households pay a single tariff known as the NRP. The difference between the prices that each company would have to charge to achieve cost recovery is met by direct subsidies, with the high-cost companies receiving larger subsidies and the lower-cost companies receiving no subsidy at all.

NRP rose from only 156,000 ROL/Gcal (approximately $10) in May 1999 to 800,000 ROL/Gcal (approximately $24) for the winter of 2002/2003. A table describing the evolution of the NRP since May 1999 is provided as Appendix 5.5.

According to the IMF, the current price ($20/Gcal excluding VAT) represents the cost-recovery price for district heating, so it may be assumed that price escalation will now slow or stop.

During Autumn 2002, there was widespread public concern in Romania that district heating would be unaffordable during the winter of 2002/2003, as a result of the price increase. This winter then turned out to be unusually cold, exacerbating the problem of affordability.

The monthly evolution of RADET's household heating prices since 1991 are provided in ROL/Gcal and USD/Gcal in Appendix 5.6 and Appendix 5.7., although it should be noted that households no longer pay these prices; they pay the NRP.

2. Local Reference Price for District Heating

Since September 2001, municipalities have been permitted to set a local reference price (LRP) at a higher rate than the NRP, the objective being to help raise their 45 percent financial contribution for direct subsidies. The legal basis for this is Government Ordinance 115/2001.

During winter of 2001/2002, no municipality actually set an LRP, so all households paid the NRP; hence the LRP has had no impact so far.

3. Spreading Heat Payments over 12 Months

According to the government's memorandum to the IMF (August 2002), the decision on introduction of equal monthly payments for households using centralized heating will be left to each individual district heating company.

In early 2003, RADET announced that late-payment penalties for households would be waived if the defaulting customers entered into, and respected, a monthly payment plan.

It is unwise to allow municipalities full discretion in design of 12-month tariff mechanisms. Such mechanisms should remain subject to approval by ANRE, as they can be used as a "back door" to introduce charges that are far removed from actual heat consumption, removing the price signal that can encourage households to save energy and money through metering, control, and weatherization.

Although 12-month payment systems are valuable for helping low-income consumers to budget, a well-designed tariff must feature a mechanism to *pay back* — either in cash or in the form of lower future bills — any overpayment by the customer against metered heat use. There is strong evidence from throughout the region (not only Romania) that

where municipalities have tariff-setting responsibilities, they over-rely on the advice of the local district heating companies; these companies in turn exploit the situation by promoting tariff mechanisms that de-couple their performance from the amount of money households have to pay.

Another approach to spreading the burden of heat payments was observed in the town of Fetesti, where during 2002, some consumers paid 300,000 ROL/month ($9.40 approximately) during the summer as a deposit towards the winter heat bill. This is an initiative of some of the OAs, which hold money in their accounts on the behalf of the households and pay the heat utility when the winter bills become due. Despite this initiative, the district heating company in Fetesti has now stopped operating as a result of widespread disconnection and non-payment.

4. Crisis Measures to Cope with High Prices and a Severe Winter

Heat prices rose from $10/Gcal to $14/Gcal-$18/Gcal to $24/Gcal over the four winters up to and including 2002/2003, the first three of which were relatively warm and the last of which relatively cold. Although some of the steps to cope with the crisis are described in detail elsewhere in this report, they are also summarized herewith to illustrate the depth of the crisis and range of the response:

- Heat Assistance Payments (top rate) were raised from $29/month to $50/month.
- Heat bills for non-metered buildings were reduced by 22.5 percent
- Romania's President intervened to unblock the EIB-RADET heat meter loan.
- The presidency of RADET passed (for a short period) to Radu Opaina, a perceived champion of demand-side issues.
- A ten-percent discount for buildings that pay the heat bill on time was introduced.
- A fixed monthly payment option — without penalties — for buildings unable to pay the heat bill on time was introduced.

5. Household and Commercial Consumers Separated

Until recently, natural gas prices for households, industries, and district heating companies were all the same, representing a very substantial household subsidy.

On 30 June 2001, tariffs for residential and small commercial consumers were separated for the first time, with the commercial tariff increasing by 87 percent — from 1,272,000 ROL/thousand cubic meters (approximately $44) to 2,396,100 ROL/thousand cubic meters (approximately $82). A 90 percent price hike for households followed two months later.

Unlike for the electricity sector, there is no government decision in force stating that whenever the value of the Leu drops by 5 percent against the dollar there must be an automatic rise in the gas price. As a result, there can be a substantial erosion in the value of any price increase between periods of price adjustment.

Monthly household natural gas prices are provided in *Appendix 5.8* and *Appendix 5.9.*

6. Targeted Inverted Block Tariff for Natural Gas

Through decision 325/2002, ANRGN introduced a targeted inverted block tariff for low-income households for the first time. Targeting is carried out using the same system that targets HAP beneficiaries (Law 416/2001).

During the winter (October through March), low-income households are eligible to pay 75 percent of the natural gas price for the first 300 m^3 of monthly consumption and 100 m^3 of monthly consumption during the summer. The subsidized gas was set at 2,063,531 ROL/th.cm (approximately $62.53/thousand cubic meters) excluding Value Added Tax (VAT), so 2,455,600 ROL/th.cm (approximately $74.41 ROL/thousand cubic meters) including VAT, benefit from the tariff.

This decision reduces the household gas bill by up to 82,000 ROL (approximately $2.48) during the summer months and 245,600 ROL (approximately $7.44) in winter months. Some 675,000 households, around half of all eligible[53] households, benefit from the tariff.

For apartments that are metered communally for cooking gas, the proportion of gas eligible to benefit from the subsidy is calculated as a proportion of that volume allocable to low-income households using the traditional per-household formula.

The financial impact per beneficiary household of operating the tariff is calculated as $2.42/month during the summer and $7.44/month during the winter, totaling $59.20 per year. Cost to the gas company is calculated as a little under $40 million per year. A table describing the basis of these calculations is provided in Appendix 6.10.

In terms of *targeting*, this subsidy is an example of best practice, as it “piggybacks” on the targeting system for heat-assistance payments; thus, there are no new targeting costs.

In terms of *design*, however, the tariff is questionable: for example, there is no evidence to suggest that low-income households have difficulty paying the gas bill during the summer. Households using gas for cooking are unlikely to change their cooking habits, and households living in buildings with a communal boiler cannot change their heating habits. For households with controllable gas-fired heating, the subsidy provides an incentive to consume more heat rather than to weatherize.

In terms of *financing*, this subsidy is an example of worst practice, since it has created a new annual $40 million social-assistance burden that is financed by the utility rather than by the government. This is poorly timed, as the utilities are nominally scheduled for privatization in the near future. The GOR website asserts that the cost of this measure will be supported by the gas-distribution companies through acquisition cost cutting, less maintenance time, lower energy consumption, and cost cutting and fewer losses in transportation and distribution.

[53] The other low-income households are not connected to the gas network.

7. Value Added Tax (VAT)

VAT (European sales tax) at 19 percent has been included in the price of household energy since the first half of 1999.

C. Impact of Energy Prices and Tariffs

1. Impact of Prices and Tariffs on Reducing Poverty Levels

The power sector has successfully raised price levels to a point at which cost recovery is possible, with the assistance of an inverted block tariff that is limited, optional, and generally well-designed.

It appears that the use of day-night electricity tariffs, which could make some impact on reducing the bills of low-income consumers on a win-win basis (as lower revenue for power can be offset by lower generation costs possible from lowering peak demand) may be under-exploited. The current day-night tariffs are unattractive to almost all households.

The district heating sector appears to have increased prices too fast and too high, reaching a level unaffordable for many households. The logical sequence of providing metering and control first to the households that cannot afford to pay higher prices and may therefore choose to buy less heat — and only then raising the tariffs — has not been followed. The problems of non-payment for heating, disconnection of buildings and apartments from the networks, and financial collapse of entire networks can be expected to worsen.

The natural gas sector sells gas too cheaply and the recently introduced inverted block tariff appears to be of poor design.

2. Impact of Prices and Tariffs on Removing Barriers to Utility Privatization

There are no apparent barriers to privatization of the electricity distribution companies, which can be expected to move ahead in the near future.

The impact of the new inverted block tariff for natural gas is not considered a particularly large barrier to privatization, as the Romanian gas industry has the potential to be extremely profitable if removed from state control and allowed to develop. Although passing the financial burden of this subsidy to the gas industry rather than government is not an example of good practice, the industry should have no difficulty absorbing this burden.

Many district heating companies are being run according to an unsustainable business model, and there are no plans to privatize. The collapse of networks is likely if the government does not make a determined effort to reform the legal environment, tariffs, and working practices to run these networks in a sustainable way. Although there are some merits in the strategy of increasing the responsibilities of municipalities for running their own networks, the municipalities are unlikely to have the necessary level of expertise in the design/implementation of appropriate tariff mechanisms to achieve

recovery of the system, and are likely to focus on short-term revenue generation rather than long-term sustainability.

Chapter 6
Financing the Energy Social-Safety Net

A. Financing Subsidies and Assistance Payments

It is useful to illustrate the scale of the various energy subsidies to acquire a feeling for their relative impact and cost. Costs are expressed very broadly in millions of U.S. dollars, based partially on past subsidies and partially on future plans.

Illustration of the Scale of the Various Energy Subsidies ($ millions)	
Electricity: optional inverted block tariff	64
IMF: cost of non-collection, electricity, and heat	123
IMF: operating loss in for heat (industrial and residential)	156
Heat: direct subsidies to district heating companies	145
SFDES: total	120
SFDES: allocation for energy efficiency	1
Heat Assistance Payments	32
Natural gas: amalgamating import and indigenous costs	350
Natural gas: inverted block tariff.	32
Natural gas: cost of under-pricing gas (IMF)	1,091
Natural gas: loss from non-collection (IMF)	107

These data, with explanatory notes, may be found in Appendix 6.1.[54]

Two features stand out from the above illustration. The implicit subsidy for natural gas is about ten times higher than most other energy subsidies, and the allocation for energy efficiency from the Special Fund for Development for the Energy Sector about ten times lower.

[54] Caveat: these figures are illustrative of typical recent years - they do not refer to a particular year. The are also not additive - as some estimates are contained within others. They are intended to illustrate the relative size of the various subsidies that have been identified.

B. Financing Energy Efficiency and Metering Solutions

1. Heat Meters in Bucharest

The European Investment Bank (EIB) is financing the installation of 26,800 basement heat meters to be installed in every district-heated building in Bucharest over a three year period. In February 2002, Bucharest municipality — which owns RADET — also created an enabling legal environment for subsequent installation of HCA/TRV bundles.

Final agreement of the EIB metering loan was delayed by over a year by political infighting, unrelated to the issue of district heating, between the mayor of Bucharest and members of the city council. The problem was eventually resolved following intervention by the Romanian president, but provides a good illustration of the case for separating local politics from the management of district heating networks.

The model recently adopted by the capital may or may not signal a turning point for district heating in Romania as a whole. RADET's network is the largest in the country' its customers richer (they live in the capital); and its management among the best. It also has benefited from several bilateral and multilateral grants, loans, and technical-assistance programs, plus it experience with non-payment/disconnection is less severe than in other cities. In summary, RADET is (relatively) bankable; whereas, most other district heating companies are not.

2. Bank Loans for Energy Efficiency

MUNEE, through APER, is sensitizing country banks to energy-efficiency investment opportunities, particularly the Romanian Commercial Bank and Romanian Banking Institute.

ARCE's director noted that stimulating soft loans for energy-efficiency improvements is a priority for the agency, which is carrying out a demonstration project to identify the relative impact of different energy-efficiency measures in three apartment buildings. The first block will have its roof repaired; the second will have doors and windows insulated; and the third will have metering installed, the objective being to demonstrate to banks that they should make soft loans for projects of this type. The preliminary result is that the level of money and time required for management and coordination present a serious barrier to this type of project.

According to APER/MUNEE, there are no known cases of apartment buildings borrowing money collectively to finance energy-efficiency improvements for the building. However, CHF has set up a specific loan facility for housing associations, which may be used for energy-efficiency related investments.

3. EBRD and World Bank Financing

The World Bank and the EBRD have a history of financing large supply-side projects rather than those relative to the demand side.

The EBRD is analyzing whether it could be involved in additional district-heating projects in collaboration with Ministry of Public Administration. The bank's lending policy

is a barrier to renovating district heating systems because projects that could be bankable over ten or fifteen years are not bankable over five (EBRD maximum) or eight (World Bank maximum).

There are certainly bankable district heating projects, and it is possible to find several pre-feasibility studies identifying good projects that have not been acted upon. However, district-heating loan projects compete against loan projects at the level of the country, and there are typically plenty of bankable projects from other sectors that do fall within the five-year maximum. Decisions about EBRD and World Bank loans are made at the senior banking and political level, not by energy-efficiency experts, so there is no high-level energy efficiency "champion" to push for district heating to take priority over other sectors. In addition, district heating is considered to be relatively high risk (in view of the current trend for disconnection from the system), so loans almost invariably require sovereign guarantees, the availability of which is limited.

Finally, it is increasingly recognized that the logical way to address energy efficiency in the district heating sector is to address demand-side issues first and supply-side issues later. This represents a barrier in terms of loans from the large international financing institutions, as the internal networks within buildings are the property of the owners, not the district heating company.

An Unsuccessful Financing Scheme. The EBRD once tried to set up an energy-conservation funding scheme (ECFS) that was intended as a loan fund for small energy-efficiency projects in Romania. EU PHARE grant assistance was available to help potential borrowers identify projects and then prepare and present loan applications. The rationale was that, although over 700 energy audits and energy-efficiency feasibility studies had been undertaken by ARCE, local energy consultants, donor institutions, and other organizations, only some 65 of the recommendations generated by the audits had been implemented. Reasons quoted were scarce capital resources in the enterprises, lack of awareness about energy efficiency, insufficient knowledge of how to present a project for financing, lack of medium- to long-term finance, and high real interest rates. EBRD tried to address some of these issues, but for a variety of reasons, particularly the attitude of local banks, ECFS failed to find borrowers and was withdrawn.

4. Bilateral and Private Support

A growing number of international banks operate on the Romanian market. For example, Austria's Bankcreditanstaldt, Canada's EDC, Italy's Fininvest, and France's Societé Generale (which bought the Romanian Development Bank) all have a strong presence.

The U.S.-funded Overseas Private Investment Corporation (OPIC) has not been very active in Romania, operating from a regional office in Zagreb, Croatia. American companies must be involved to get credits from OPIC, which typically acts as a loan guarantor, providing insurance on debt that comes from third parties such as the Exim bank

The U.S.-funded Romanian-American Enterprise Fund, which carried out a very successful project that paid back its initial capital, is now an independent revolving fund. This is the only case in which USAID has established a fund in Romania.

USAID is also planning an energy-efficiency loan guarantee facility for Romania.

5. Special Fund for Development of the Energy Sector (SFDES)

SFDES, which has been running since 1994, involves a charge on the transmission system representing ten percent of sales to industrial power consumers and two percent of sales to industrial heat consumers. Residential sales are not subject to the charge.

SFDES is worth some 3,840 billion ROL per year ($120 million), which is traditionally used only for very large power engineering works. The Energy Efficiency Law of 2000 specified that energy-efficiency projects are eligible for support from the fund, and as a result some $1.5 million was allocated for energy efficiency in 2001, and a further $3 million in 2002. According to the above Law, up to 50 percent of energy-efficiency funding may be used for household-level grants, but this has not happened. So far, all the money — allocated at the discretion of ARCE — has been spent on district-heating network rehabilitation (15 projects) and biomass (5 projects).

In theory, the SFDES can be used for projects involving the production of electrical and thermal energy; reduction of transport and distribution losses; improving energy efficiency for end-users; and implementing renewable energy and fuel-substitution projects. In practice, however, the fund has not been used for end-user projects.

Although all industrial energy consumers (public and private) must contribute to the fund, the money is spent exclusively on public-sector projects.

According to the government's memorandum to the IMF of August 2002, the tax on electricity used to finance the special fund will be reduced by one percentage point beginning January 2003, to reduce industrial production costs. SFDES will also be incorporated into the state budget in order to improve the transparency of Romania's fiscal policy.

6. Romanian Energy-Efficiency Fund (FREE)

The Global Environment Facility (GEF) has provided $10 million dollars for this project disbursed through the World Bank: $8 million for a revolving loan fund and $2 million for fund management and administration. An implementing agency, the FREE, was established by Government Decision No. 124/2001 and became active upon signature of a grant agreement between GOR and the Bank on October 18th 2002. FREE works closely with a consultant fund manager consortium, and can loan up to $1 million per project. A website is maintained at www.free.org.ro.

7. UNDP/GEF Capacity Building for Energy Efficiency

GEF also provided $2 million for the project, "Capacity-building for GHG Emissions Reduction through Energy Efficiency." A small team of banking and energy specialists will help energy consumers find commercial financing for energy-efficiency projects.

Small amounts of grant financing in the form of technical assistance will leverage much larger sums for private- and public-sector projects. $450,000 of the budget may be used for direct investment to help leverage difficult-to-finance public-sector projects. This project stalled for several years, but a new project manager re-launched it during the summer of 2003. A website is found at www.energie.undp.ro

8. Romanian American Enterprise Fund (RAEF), EBRD, and Energy-Serv

A new $15 million energy-efficiency fund that will focus on co-generation was capitalized in 2003 by RAEF ($3 million), EBRD ($11 million), and the ESCO Energy-Serv ($1 million). Its projects are likely to have an industrial focus.

9. Energy Service Companies (ESCOS)

For Romania, an ESCO can be defined as an engineering company that carries out work at the behest of clients on a fee basis. A handful of international players, such as Trapec (a subsidiary of Tractebel of Belgium), are active in this area. USAID trained a number of small engineering companies to become ESCOs in 1994, some of which continue to carry out energy audits, energy-efficiency feasibility studies, and so forth. Former state institutes now privately owned, such as ISPE and ICEMENERG, are also active in this field.

The model of ESCO that uses its own money to invest on the behalf of clients under performance contracts or similar arrangements has not really taken off, although EnergServ has aspirations in this area. Both APER and Honeywell noted that this ESCO model does not appear to work in local conditions.

10. Supplier Credits and Export Credits

Isolated incidences of supplier credits and export credits for energy efficiency equipment were identified. For example, the German firm Techem, which sells heat cost allocators, was established in Romania in 2002 and markets household HCA/TRV bundles that may be paid off over 24 monthly installments. Honeywell, which manufactures and supplies TRVs, works with Techem and others to complete the HCA/TRV bundles but operates strictly on a cash basis.

Danfoss, a Danish company, provides TRVs to the City of Cluj — these payable in installments. This was something very new in Romania and required the company to develop personal relationships with municipal officials and to finance missions to Denmark for training/awareness. Danfoss described the key success factors as developing personal trust, starting small, and investing time.

11. Micro-Credits to Households

The Cooperative Housing Foundation (CHF) is carrying out a USAID-funded program to lend money for energy efficiency and other activities in the city of Timisoara, and will expand its activities throughout the west of Romania. CHF has demonstrated the effectiveness of step-by-step financing in Romania. The possibility of CHF working with FREE and/or the SFDES to generate supplier credits for weatherization, metering, and controls has been discussed as a possible direction of future development.

12. EU Energy Project

The EU project, “Fiscal and Financial Incentives to Promote Energy Efficiency,” was carried out in 1999 by ERM consultants (UK). From an original 80 energy-efficiency policies considered and screened, the instruments were pared down to 41 to be eventually described and reviewed as part of the study. Recommendations were limited to measures that the consultant and interviewed energy-efficiency stakeholders considered could realistically be implemented, taking into account Romanian budget constraints, welfare issues associated with using scarce state funds, and a review of local stakeholder priorities.

The main recommendation was a national energy-efficiency program with an annual budget of 5.5 million Euro (approximately $5.5 million) to be funded from the SFDES for support for an energy-efficiency revolving fund ($0.05 million); co-financing projects with local authorities ($1.2 million); grants for dissemination of good practice ($0.2 million); grants for energy audits ($0.02 million); subsidized CFLs ($1.6 million); and grants for retrofitting residential buildings ($2 million).

The project highlighted that financial and fiscal measures represent only a very small component of what would be required to make a significant improvement on energy efficiency on a national scale, and suggested an additional fifty priority actions that Romania could consider in this respect. The Final Report is held by ARCE.

13. Municipal Guarantees

Municipal guarantees for energy efficiency are rare, with the example cited above between Danfoss and the City of Cluj being the exception rather than the rule.

The ISPA Program’s municipal fund provides subsidized loans (30 percent loan, 70 percent grant) for municipal water, waste projects, etc., but not district heating. According to the EBRD, there is no particular reason why heating is excluded; it simply didn’t feature on the agenda at the time when ISPA was agreed upon.

14. Grant Financing

EU Phare is planning to invest at least $10 million in household-level metering, as described in Chapter 4 of this report.

C. Financing the Use of Tariff Mechanisms

The government does not compensate either Electrica or Distrigaz for the costs of operating the inverted block tariffs, so the costs of these social subsidies are carried by the utilities. The electricity tariff is nominally funded through a cross-subsidy within the residential power sector, and the gas tariff through nominal efficiency improvements by the gas companies.

Chapter 7
Recommendations for Romania

A. Subsidies and Assistance Payments

1. Consider Reimbursing the Cost of Operating the Social Tariff to Electrica

The social tariff in the power sector appears to be one of the best designed and most successful in the region. It is relatively low cost as it applies to a limited consumption; partially self-financing, as consumption above the threshold is expensive; encourages consumption discipline; promotes energy efficiency; and is very popular. However, the key success factor is a household's ability to monitor monthly consumption against the threshold, so plans to stop reading meters every month are incompatible with the tariff. The tariff is an example of government passing the cost of social assistance to the utilities, so in the interests of best practice the GOR should reimburse the costs of operating the tariff to Electrica. The cost to government may be recovered from the (profitable) privatized power companies through the ordinary taxation system.

2. Consider Reimbursing the Cost of Running the Inverted Block Tariff to Distrigaz

The same principles apply.

3. Consider Raising Natural Gas Prices to True Market Levels

The policy of subsidizing natural gas by selling it artificially cheaply represents an untargeted subsidy that benefits rich consumers (who typically consume more) more than it benefits lower-income consumers. The cheap gas policy also lowers the incentive for households to weatherize and to improve the efficiency of gas use.

4. Consider Defining HAP by Expenditure where Heating Costs are Uncontrollable

For households that cannot control their own heating costs (such as centrally heated apartments without individual autonomous control), HAP could be expressed as the balance payable by the state after the household has made a fixed contribution. This would better protect low-income households that consume more than the official average of 1.334 Gcal but have no way of reducing heating expenditure, so currently find the balance of their heating bill unaffordable.

Note that this should be considered a temporary solution; the sustainable solution would be to make heating costs controllable for such households.

5. Consider Making Payment of Utility Bills a Condition of Receiving HAP

In several countries, households must demonstrate that utility bills are fully paid up in order to be eligible for HAP. This proven-effective system could be applied in Romania.

6. Consider Removing the Option for Customers to Receive HAP in Cash

Some households living in centrally heated buildings choose HAP for solid fuels (payable in cash) rather than HAP for gas or district heating (payable to the building administration on the behalf of the utility). This is an example of social policy contributing to the collapse of centralized energy systems. Consider removing this option for households that are connected to central heating networks.

7. Avoid Creating New Can-but-Won't-Pay Customers

Law 116/2002 on Social Eviction appears to be well thought-out, as it does not remove the burden of payment for electricity and other utilities entirely. However, it should be monitored carefully because it may be open to abuse. Removal of the legal right for utilities to disconnect households — as in the case of this law — can create a new category of non-paying households that could pay but enjoy a new legal right not to, so they simply stop paying.

8. Remove Ownership of a Microwave Oven from Social Assistance Eligibility Rules

Ordinance 6/2003, which updates eligibility rules for social assistance and HAP, includes ownership of a microwave oven as an indicator of a luxury lifestyle. This is a poor indicator, as a microwave can cost as little as $70. Also, microwaves represent an energy-efficient, low-cost option when cooking or re-heating small amounts of food for one or two people; thus, their ownership[55] by low-income households should be encouraged, not discouraged.

B. Energy Efficiency

1. Consider Creating a Formal Governmental Policy on Low-Income Energy Issues

At present, no Romanian governmental institution has specific responsibility for low-income energy issues.

Here are four key first steps: one, create an official Romanian definition of fuel poverty — the international recognized definition being that of a household that spends more than ten percent of its net income on energy; two, make a specific government department responsible for addressing low-income energy issues; three, set a national target for the eradication of fuel poverty; and four, publish a fuel poverty eradication strategy.

2. Consider an Energy-Efficiency/Weatherization Program for Social Institutions

A characteristic of some Romanian schools, hospitals, and social institutions is that they can be highly energy inefficient and, in the case of some rural schools, inadequately heated on the coldest winter days. The government, together with members of the

[55] Microwaves are not recommended as the primary appliance for household cooking.

international community, could consider a practical heating rehabilitation and weatherization project for these institutions. USAID experience in countries such as Armenia has proved the effectiveness of this type of program, which can be cost effective and highly visible.

3. Consider a National Low-Income Metering and Weatherization Program

Several studies and advisors in the past have recommended a range of energy-efficiency measures for Romania: a stronger, more-independent energy efficiency agency; a well-managed long-term energy efficiency fund; a $5.5 million annual budget for energy efficiency; and a national energy-efficiency program.

Creation of specific recommendations is beyond the scope of this study, but the general principle that the Romanian government should have a much stronger focus on energy efficiency is fully endorsed.

4. Consider a Weatherization Program for Rural Households

In Romania, 45 percent of households live in rural areas, which include the poorest sectors of the community. A rural weatherization program could help some of the most-vulnerable members of society to cope with recent energy price rises.

5. Meter Heat and Hot Water, both for Buildings and for Individual Apartments

The price signal is the most-effective way to persuade households to invest time, effort, and money in energy efficiency. Metering at the level of a building is a necessary but insufficient step toward this, as energy wasted/saved by an individual household is a cost or benefit for the neighbors rather than the household. Volumetric meters for water and HCAs for heating should be introduced in all Romanian apartments.

6. Consider Fundamental Reform of District Heating

Romania runs its district heating system using an unsustainable business model. Key steps for district heating reform are first to enable households to respond to the price signal, and only then raise prices. In these circumstances, consumers would respond to the price signal by reducing heat consumption according to their budget and/or by weatherizing. The only way most Romanian households can respond to the price signal at present is by disconnecting and/or refusing to pay.

District heating reform could be carried out in three distinct phases:

- ***Phase One: Reestablish the Payment Culture.*** Rapidly introduce universal basement metering; create clear legal norms for heat cost allocation; create optional no-risk heat-only tariff options; create optional 12-monthly tariffs based strictly on metered consumption and featuring a mechanism for repaying customers who over-pay; run awareness campaigns; introduce HCAs universally [consider making this a legal requirement]; and use international assistance to help finance and manage the rapid implementation of Phase One before too many more district heating networks collapse.

- Raise prices, which would become possible, as households can now respond to the price signal (i.e., turning off radiators, heating rooms to lower temperatures, weatherizing), if they find the higher prices unaffordable. Offer energy-efficiency and weatherization services and programs that harmonize with the newly introduced price signal. Attract disconnected customers back to district heating by offering free, no-risk re-connection (on a pay-for-what-you-use basis); create regulatory rules for rapid disconnection from the internal heat network for customers who have the means to control their own consumption but do not pay; remove the right to receive HAP for solid fuels for households living in centrally heated buildings; consider zoning to prevent the use of natural gas and solid fuels in district-heated buildings; introduce optional 12-monthly tariffs (but keeping a pay-for-what-you-use tariff option, too); and keep overall regulatory control with the national regulator, not municipalities.
- ***Phase Three: Grow.*** Offer optional premium services such as higher temperatures and longer heating seasons; rehabilitate the supply side to meet the demand for which customers have demonstrated they are willing to pay.

Consider the following to improve the energy efficiency of district heating:

a. Clearly Identify Networks to be Abandoned and Those to be Retained

The phenomenon of the district heating networks closing is not yet over. Disconnection by households will lead to more networks becoming financially unsustainable.

b. For Networks to be Abandoned, Focus on Helping Low-Income Households

The collapse of centralized heating networks creates a financial crisis for low-income households faced with the need to find another heating option.

c. For Networks to be Retained, Consider Fundamental Reform and Request International Assistance

District heating cannot compete successfully against subsidized natural gas, so an essential first step is to prevent more households from disconnecting from the heat network in favor of gas. There are various ways to do this: prevent new gas connections by law, or make payment for district heating mandatory even for households that disconnect; correct the price signal by more than doubling the price of household natural gas; and introduce universal individual metering and control, making district heating a more-attractive heating option than natural gas.

The requirement for very large capital investment suggests that the introduction of Private-Public Partnerships could be the key to recovery for Romanian's district heating networks.

d. Create Clear Legislation on Heat Cost Allocation

Norms to accompany Government Ordinance 73 of 28th August 2002 should clearly solve the issue of what to do about individual households and OAs that oppose the

introduction of HCAs. Key features would be limiting the share of heat consumption to be allocated equally among all households to cover heating of common parts of the building and other internal losses; a requiring the OAs, not households, to pay the cost of meter reading and billing; and calculating the share of non-participating households by taking the highest recording HCA on any radiator in the building and applying that reading, plus 10 percent, to each radiator in the non-participating household. Annex. 1 to Decision 41, 14 February 2002 from Bucharest Municipality could provide a good model for national norms (taking into account the critical comments on Decision 41 made in Chapter 4 of this report).

e. Consider Zoning to Prevent Natural Gas from Being Used in District-Heated Buildings

This measure is likely to be opposed virulently by the natural gas lobby, but it represents best practice energy-efficiency policy. It is reasonable to prevent households from installing natural gas appliances in apartments that were designed for district heating and are without adequate ventilation for natural gas appliances. However, it is unreasonable to prevent households from using gas if there is no affordable alternative, so this measure should be considered only in conjunction with other reforms proposed in this report.

f. Consider Zoning to Prevent Solid Fuels Being Used in Apartment Buildings

The creation of “smokeless zones” could prevent the use of solid fuels in apartment buildings that are connected to heat or natural gas networks. There are well-documented health risks attached to the use of solid fuels in multi-household dwellings.

g. Offer Free Reconnection to the District Heating Network for Returning Customers

The energy efficiency of district heating networks (as well as revenue for the utility) rises according to the number of connected households. If offered service on a no-risk, pay-for-what-you-use tariff, customers will choose to reconnect because, when offered on this basis, district heating becomes the most-convenient (and possibly least-cost) heating option. (Note: this measure is unlikely to be effective unless the issues that motivated households to disconnect are resolved first).

h. Create Strong Legal Powers to Disconnect Households that Do Not Pay

When households are able to control their own heating costs and have been offered a pay-for-what-you-use tariff (but not before then), it becomes reasonable and just for utilities to disconnect households that do not pay. This may require strengthened legal powers for the district heating utilities, together with improved consumer-protection regulations (through ANRE) to ensure that heat utilities adhere to appropriate codes of practice.

C. Tariffs

1. Consider Creating Win-Win Day-Night Electricity Tariffs

Consider creating day-night tariffs that feature a discount for night-time use but without a premium for daytime use (i.e., the daytime rate could be the same as the standard tariff, and the night-time rate lower). If well-designed, this tariff can represent a win-win energy-efficiency measure, as the power utility saves by flattening the load curve and the customer wins by paying less.

2. Consider Removing Vacation Homes from the 'Social Tariff' for Electricity

One of the strengths of the social tariff is that it is optional, so low-income households can target themselves. Higher-income households can invest in energy-efficient appliances in order to use the tariff and remain within the threshold of 60 kWh/month, which represents desired behavior — this is considered to be a good side-effect rather than a bad one. The only real downside is that owners of vacation properties, who in Romania are by definition rich, benefit from this subsidy too.

It should not be difficult to identify these consumers and move them to the standard tariff or another tariff option. They can be targeted in two ways: by analyzing demand patterns of households in resort areas, comparing consumption in the vacation season with that during out-of-season months; and, empirically, by cooperating with meter readers/collectors, who typically know which households are vacation homes.

When considering the cost of targeting vacation homes to remove them from the social tariff, note that the overall cost of the tariff is around $64 million/year, and up to 20 percent of subscribers may be vacation properties. If the cost of targeting vacation households is lower than around $13 million, the exercise will be worthwhile.

3. Consider Offering Payment-Collection Contracts to Owners Associations

Romania could consider offering collection contracts for electricity payment to well-functioning OAs that demonstrate a history of financial prudence. This would be a natural extension of their role, as they already collect money for heating and water. It would represent a win-win situation for all parties: households could pay all bills at one place, OAs would have a source of income, Sinserv could focus its activities on meter reading and billing, and Electrica could both lower collection costs and improve cash flow.

This suggestion should be analyzed locally, as in some respects it goes against conventional wisdom. Some other power utilities in the region suffer from non-payment by households; corruption by meter readers; and could not possibly work with OAs, which can be disorganized, mismanaged, or corrupt. For such countries, it is usually recommended that households pay at the utility’s payment office or through the bank. However, as Romania features households that pay, has honest meter readers, and well-functioning OAs, this could be a viable win-win solution.

4. Consider Relocating Electricity Meters in Apartment Buildings

[This is considered to be a tariffs issue in the context of resolving the dilemma of whether to continue to operate the social tariff for electricity, which relies upon monthly meter reading, and reducing the frequency of meter reading to lower costs.]

Romania could carry out a study of the costs of removing electricity meters from apartments and placing them all together in the communal hallways of buildings. The benefits would include much lower meter-reading costs, as the meter reader would not have to visit apartments; improved cash-flow, as there would be no need to stop reading meters and billing on a monthly basis; the specific benefit of being able to continue to use the social tariff, which has been shown to be incompatible with six-monthly meter reading; and it would become far harder for households to tamper with meters, although meter fraud is not considered to be a large problem in Romania. The costs of moving meters should be relatively low, consisting primarily of labor — which is still relatively cheap in Romania — and wiring, as the existing meters would be reused.

5. Consider Making "Independent" Regulatory Authorities More Independent

Political intervention in the tariff-related and other activities of the regulatory authorities remains a problem in several central and eastern European countries (including Romania), where the principal of independent regulation has taken hold in name only, and real power continues to rest with the politicians. The presidents of ANRE and ARNGN have been changed several times in their short histories, which would be almost impossible (except in the case of illness, etc.) if these agencies were truly independent. A good example of problems caused by political interference with regulation is the way the Ministry of Industry and Resources imposed an increase in the social tariff threshold from 50 kWh/month to 60 kWh/month. Before this took place, the tariff was working well, with the single problem that too many households had selected it, so the ministry's intervention exacerbated this problem.

6. Consider an Independent Review of the Regulatory Regime for All Energy Sectors

Romania has chosen to create four regulatory authorities and an agency to control different aspects of the energy sector. There are advantages and disadvantages to this approach. Disadvantages include the existing imbalance between energy prices (natural gas being too cheap compared with other fuels); responsibility for demand-side energy efficiency being spit between ANRE, ANRGN, ANRSC, ANRM, and ARCE; and a weak regulatory regime for combined heat and power. None of the above appeared to consider low-income energy issues to be within their specific purview.

7. Raise the Unit Price of District Heating

When households have better control over their heating costs and appropriate tariffs, the barrier to raising prices is removed. Households can respond to price increases by weatherizing, lowering temperatures, heating fewer rooms, or closing radiators; it is no longer necessary to respond by disconnecting.

Arguments for and against a capacity charge in a district heating tariff are complex. It is suggested that a *minimum charge* of around 30 percent of a typical household bill is the best option. This is not the same as a fixed charge of 30 percent, which is a sub-optimal solution. A *minimum charge* dissuades households from disconnecting from the heat network, as they have to pay for 30 percent of the bill anyway, so they may as well remain connected to use the heat for which they have paid. Conversely, a *fixed* charge creates an incentive to disconnect, as the household must pay the charge but receives no heat for this payment. A *minimum charge* also maximizes the incentive to weatherize and save money, as the simple proposition "turn on the radiator and pay – turn it off and do not pay" applies.[56] A *fixed* charge does not achieve this.

The relative merits of a *minimum* charge and a *fixed* charge are described in detail elsewhere in this report.

8. Provide the Regulator with Powers to Oversee District Heating Tariff Mechanisms

Municipalities should not be given full powers to set tariff mechanisms, as they may be over-influenced by advice from local district heating companies, who may abuse their monopoly position and local influence by promoting badly designed tariffs that remove the direct link between metered heat sales and revenue. Optional 12-monthly payment systems are to be encouraged but should always feature a mechanism to *pay back* — either in cash or in the form of lower future bills — any overpayment by the customer against metered heat consumption.

9. Consider Redesigning the Inverted Block Tariff for Natural Gas

The recently-established inverted block tariff for natural gas is a poor example of tariff design. There are four main criticisms (in addition to the previously mentioned criticism about the government passing costs of social assistance program to the energy utilities).

- As winter heating, not summer cooking, represents the main source of financial difficulty for low-income households, there is a case for removing the summer component of the subsidy, which addresses a problem that does not really exist.
- The maximum impact of the subsidy (for households that consume to the threshold) during the summer is $2.48 per beneficiary household. The administrative burden of operating the tariff may not be justifiable for a measure with such a low impact.
- The tariff does not encourage consumers to substantially change their behavior. A 25 percent discount is unlikely to motivate consumers to focus particularly hard on lowering their gas use to keep consumption below the threshold. This may be compared with the social tariff for power, where consumption above the threshold attracts a 430 percent premium, providing a strong incentive for consumers to change their behavior.

[56] It is assumed no occupied household – even if saving aggressively - could lower its heat consumption by more than 70 percent, so the ratio of heat use to the heat bill is one-to-one.

- The subsidy can be considered inequitable (unfair), as only natural gas customers receive it. Furthermore, the tariff does not discriminate between customers who can control their own consumption, those living in heated apartments (where the gas is used to provide heat via a boiler in the basement, with costs allocated between households), and those connected to the un-metered cooking gas only.

In summary, it is suggested that the design of the tariff be subject to a review.

10. Consider Strengthening Regulatory Data Collection, Analysis, and Publication

Romanian regulators appear to have no data on how utilities treat captive customers who do not pay. Data should be collected in a formal way and compared year against year, utility against utility, Romanian utilities against other utilities; the analyses should be published; and Codes of Practice should be developed.

Average Monthly Exchange Rates 1991 - 2002, ROL/USD

	1991	1992	1993	1994	1995	1996	1997
Jan	35	195	470	1,387	1,776	2,599	4,963
Feb	35	198	511	1,494	1,799	2,774	6,896
Mar	36	198	586	1,601	1,833	2,873	7,236
Apr	60	198	604	1,671	1,865	2,911	7,049
May	60	224	621	1,657	1,911	2,930	7,091
Jun	61	261	688	1,667	1,956	2,988	7,172
Jul	62	349	769	1,686	1,994	3,063	7,164
Aug	61	375	809	1,688	2,046	3,144	7,445
Sep	61	404	870	1,727	2,100	3,201	7,529
Oct	60	430	985	1,753	2,166	3,296	7,702
Nov	202	430	1,068	1,757	2,395	3,478	7,808
Dec	186	433	1,141	1,774	2,558	3,734	7,960
An. Ave.	77	308	760	1,655	2,033	3,083	7,168

	1998	1999	2000	2001	2002	2003
Jan	8,293	11,354	18,353	26,243	32,052	33,448
Feb	8,231	12,271	18,702	26,815	32,233	
Mar	8,207	14,054	19,207	27,299	32,766	
Apr	8,380	14,793	19,759	27,878	33,102	
May	8,477	15,238	20,393	28,493	33,491	
Jun	8,569	15,757	21,031	28,952	33,392	
Jul	8,699	15,921	21,601	29,364	32,979	
Aug	8,781	16,101	22,422	29,809	33,094	
Sep	9,050	16,359	23,602	30,236	33,116	
Oct	9,381	16,706	24,538	30,786	33,242	
Nov	9,909	17,447	25,103	31,299	33,545	
Dec	10,529	17,996	25,604	31,556	33,654	
An. Ave.	8,876	15,333	21,693	29,061	33,055	

Source: Romanian National Bank

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Appendices

Appendix 1.1

Progressive Collapse of the District Heating Networks since 2000

	Operational district heating systems	No. new collapses	Cumulative no. collapses.
1999/2000	251	0	
2000/2001	204	47	47
2001/2002	179	25	72

Appendix 1.2

The World Energy Council's 'Neptun Declaration'

Neptun Declaration[57] on "Revitalising district heating and co-generation in central and eastern Europe"

The participants of the WEC Workshop on "Restructuring and privatising the district heat and CHP industries in central and eastern Europe", held in Neptun (Romania) on 10 June 2002:

> noting that on average 60 % of buildings in the region are centrally supplied with heat, and that district heating and co-generation plants absorb 39 % of primary energy supplies [58],
>
> concerned that the heritage of the past caused and continues to cause heavy losses in generation, transmission and end-use of heat of 35 % and more of the heat generated; this prevents cost-effective operations and investments, affects customer satisfaction and delays the optimization of local energy systems;
>
> welcoming the measures taken or contemplated by Governments to modernize and restructure the heat supply industry;
>
> welcoming reports of successful implementation of reforms which indicate that decentralization and privatization of heat supply must be accompanied, if not preceded, by supportive measures;
>
> anxious to assist and, to the extent possible, accelerate the process;

[57] as adopted at the Workshop and by the WEC Group Central and Eastern Europe at its session in Cairo in October 2002

[58] IEA Energy Balances 1999; weighted averages

believe it to be desirable if

I. GOVERNMENTS

A. with regard to DH/CHP policies generally recognize district heating (DH) and combined heat and power (CHP) systems

- as important for the well-being of the population;

- as important components of the national energy economy, comparable to gas and electricity;

- as a means to reduce pollution and attain CO2 reduction targets;

- as a means to absorb unemployment and enhance skills

encourage access to capital markets by initiating or accelerating the process of restructuring, price liberalization, decentralization and, possibly, privatization of DH and CHP companies, bearing in mind that several ownership and management models can apply;

encourage pilot projects, pending the implementation of systemic and nation-wide DH/CHP policies; such pilot or island projects would address isolated local systems in their entirety or parts of systems (small-scale generation, pipeline rehabilitation, end-use efficiency, metering, …);

increase the role of local authorities in the development of local energy systems

B. with regard to financing

encourage foreign investments in granting national or most-favored nation status, without exception, and secure a predictable legislative and regulatory framework;

encourage third-party financing of DH/CHP investments (performance contracting), joint implementation and emission trading;

eliminate old debt, thus enabling a fresh start of the DH/CHP industries;

compensate for foregone revenues of DH/CHP companies as a result of applying special heat tariffs for the poor;

recognize the social and economic implications of heat supply and, were necessary, grant well targeted and transparent subsidies for a limited period of time, financed from public budgets;

C. with regard to regulation

establish an independent regulatory body for, inter alia, granting licenses, determining heat supply tariffs for captive customers, access to grids, and metering and billing procedures; this regulatory body should cover all grid-based energies so as to secure a common competitive framework;

divest these functions to the extent possible to the local authorities;

eliminate preferential pricing, taxation and regulatory regimes for competing fuels;

choose the type of access to grids according to local circumstances (third party access, single buyer principle, economic merit order …);

eliminate progressively cross-subsidies between households and industrial consumers, and between categories of industrial customers'

promote

- fair rules for the allocation of costs and benefits from co-generation to electricity and heat prices respectively, if markets for electricity and heat operate under different regulatory regimes

- the transparency of tariffs

- improved services to customers (installation of meters, insulation, use-related billing)

building codes, energy auditing

- EU/IEA-compatible statistics on heat generation, transmission and use

II. MUNICIPALITIES

develop economic, long-term plans, based on community needs, considering DH/CHP as integrated part of local energy systems using gas, coal, refuse or renewables and promoting insulation, the rational use of heat, co-generation and, where appropriate small, decentralized plants;

encourage effective multi-fuel competition on the local energy market and the liberalization of energy prices generally;

arbitrate the long-term development of grid-based energies (heat, gas, electricity) on the basis of life cycle cost;

abstain from operational activities, rather entrust the ownership or management of DH/CHP companies to the private sector, in particular energy service or multi-fuel companies.

Given at Neptun, this tenth of June, 2002

Prof. Aureliu Leca Chairman Workshop	Natan Bernot Chairman WEC Group Central and Eastern Europe	Dr. K.Brendow WEC Regional Coordinator Central and Eastern Europe

Appendix 2.1

Estimate of the Impact of HAP on Heating Bills, Winter 2001/02

	Gcal per room a	No. of rooms b	Gcal per h/hold (a x b) c	NRP per Gcal d	Gross cost per month (c x d) e	Heat Assistance Payments f	Net cost per month (e - f) g
Winter of 2001/02 (Typical exchange rate $1:32,000 ROL)							
ROL							
Severe	0.6	2.5	1.5	600,000	900,000	700,000	200,000
Mild	1.0	2.5	2.5	600,000	1,500,000	700,000	800,000
USD							
Severe	0.6	2.5	1.5	18.75	28.13	21.88	6.25
Mild	1.0	2.5	2.5	18.75	46.88	21.88	25.00
First half of winter 2002/03 (Nov-Dec 2002) (Ave. exchange rate $1:36,000 ROL)							
ROL							
Mild	0.6	2.5	1.5	800,000	1,200,000	980.000	220,000
Severe	1.0	2.5	2.5	800,000	2,000,000	980,000	1,020,000
USD							
Mild	0.6	2.5	1.5	23.81	35.72	29.17	6.11
Severe	1.0	2.5	2.5	23.81	59.53	29.17	28.23
Second half of winter 2002/03 (Jan-Feb 2003) (Est. exchange rate $1:33,000 ROL)							
ROL							
Mild	0.6	2.5	1.5	800,000	1,200,000	1,656,000	-456,000*
Severe	1.0	2.5	2.5	800,000	2,000,000	1,656,000	344,000
USD							
Mild	0.6	2.5	1.5	24.00	36.00	49.68	-13.68*
Severe	1.0	2.5	2.5	24.00	60.00	49.68	10.32

*Negative figures denote HAP rates that were more than required to meet heating needs during a mild winter - but by this time it was already known that the winter was severe.

Source: own calculations based on heat consumption estimates provided by Foundation for Civic Action (FCA).

Appendix 2.2.

Fuel Expenditure - Employed, Peasants, Unemployed, Pensioners

Household category	US $/month					
	1995	1996	1997	1998	1999	2000
Employed						
Wood, coal	2.05	2.13	1.48	1.71	1.23	1.12
Electricity, heat	4.28	3.84	3.71	6.34	6.87	8.79
Natural gas	0.96	0.86	0.99	1.47	1.76	2.26
Peasants						
Wood, coal	2.89	4.01	3.01	1.23	2.33	1.94
Electricity, heat	1.24	1.1	0.91	1.55	2.1	2.55
Natural gas	0.09	0.08	0.08	0.16	0.2	0.11
Unemployed						
Wood, coal	1.33	1.48	1.02	1.25	0.9	0.67
Electricity, heat	2.7	2.5	2.21	3.96	4.25	5.43
Natural gas	0.57	0.51	0.57	1.14	1.34	1.42
Pensioners						
Wood, coal	4.01	4.01	2.99	3.34	2.52	2.08
Electricity, heat	2.25	1.99	1.69	2.93	3.39	4.37
Natural gas	0.58	0.54	0.62	0.98	1.16	1.4

Source: National Institute of Statistics, Romania.

Extracted from "Population Consumption Bulletin" (1995-2001), with the kind permission of the National Institute of Statistics, Romania.

Appendix 2.3

Extract from 'Early Warning Report #5, 2002

Extract from Economic Policy Challenges by Daniel Daianu, published in 'Early Warning Report, Romania', Issue #5, 2002

UNDP and Romanian Academic Society (SAR).

Arrears and the Price of Energy; the Social Dimension

As a phenomenon, arrears (financial indiscipline) can be much compounded by the ability (or inability) of many households and firms to respond adequately to the drastic change in the relative price of energy. It is hard to dispute the rationality of the rise in the price of energy for the corporate sector to a market equilibrium level; this rise is part and parcel of the process of imposing hard budget constraints in the economy by eliminating an across the board subsidy and of stimulating energy saving and productivity gains in the enterprise sector. A more refined analysis should be made in the case of households. A similar big rise in the energy price happened in early 1997, whereas, at that time, the proportion of individuals living below the poverty line was about 22% of the population. During 1997-1999, as a result of very painful adjustment measures, the economy plunged, which had a quite severe impact on many people's incomes. At present, the proportion of the population living below the poverty line is of more than 40%. Even before the rise in the price of energy price, many households (especially made up of retired people) were not capable of paying their electricity and heating bills during the cold season. It is no secret that these people will continue not to be able to pay their energy bills; and the collection rate of these receivables (for the energy suppliers) will fall accordingly. Therefore, the financial situation of energy providers is not likely to improve in this respect; indeed, overall things could get even worse, especially considering the social implications of this measure as well. Arguably, the rise in the price of energy for households was not well calibrated (it was too high). In addition, it was not accompanied by a program of a distribution in time of the additional payments to be made by households. Arguably, the Government should have tried to implement a two-tier price structure, with the household sector paying less.

However, to reduce the price of energy for households now would be a non-starter, since it would damage the policy credibility in general. To keep the price of energy stable for a longer period of time (which should cause its erosion due to inflation) does not solve the problem in the immediate future. Consequently, the Government has no choice but to come to the rescue of the most afflicted individuals. Reportedly, it intends to work out an assistance program for those who cannot pay, but its technicalities are still to be drawn up. Whatever the means envisaged for alleviating the financial burden put on low-income households, one should be aware of the threat that some of

those who used to pay may cease to do it – which would make the situation for the energy providers even worse – unless the assistance is very well targeted. Equally, if subsidies are considered, these should be paid directly into the escrow accounts of the energy suppliers, instead of being given to low-income individuals, in order to prevent that subsidies be diverted to other purposes.

It is fairly difficult to evaluate the impact on the finances of energy suppliers of the rise in the price of energy for households; it is also difficult to estimate the impact on the public budget of the pledge made by government to help needy families, since this assistance has not been yet outlined in concrete details. As far as the corporate sector is concerned, a very strict monitoring has to take place in order to verify whether payment amelioration, where it does exist, is sustained. In addition, it may well be that some of the firms, which eventually started to pay (or pay more) for electricity and heating, in order to avert being disconnected from energy suppliers, increased their arrears toward other suppliers. Thus, aggregate arrears may not necessarily decrease, as it is expected. Such a state of affairs would be bad omen for the sustainability of economic recovery and would not wait too long before showing up in the books. This is why the Government urgently needs to identify the worst offenders, those who can pay but do not pay, and put pressure on them.

Appendix 3.1

Social Tariff: Actual Revenue Generated, June 2002

		Threshold of 60 kWh/month		
		under	over	total
	Sales to all 'social tariff' households (kWh)	91,311,000	11,773,000	103,084,000
	Sales to all 'social tariff households' (ROL)	99,779,838,000	45,834,125,000	145,613,963,000
	Number of 'social tariff households	3,477,556	3,477,556	3,477,556
	Ave. sales per 'social tariff' household (kWh)	26.3	3.4	29.6
	Ave. sales per social tariff h/h (ROL)	28,693	13,180	41,872

Source: Electrica, 2002

Appendix 3.2

Social Tariff: Hypothetical Revenue If No Such Tariff, June 2002

	'Standard tariff' commodity charge (ROL/kWh)	2,106	
	Actual sales to 'social tariff' households (kWh)	103,084,000	
	Hypothetical income from commodity charge (ROL)		217,094,904,000
	Standard tariff capacity charge (ROL/HH/day)	1,044	
	Number of days in June	30	
	'Standard tariff' capacity charge - June (ROL/HH)	31,320	
	Number of 'social tariff households	3,477,556	
	Theoretical Income from capacity charge		108,917,053,920
	Theoretical total income (capacity + commodity) (ROL)		326,011,957,920
	Theoretical income per household (ROL)		93,747

Source: author's estimates based on Electrica data

By comparing the 'actual' and the 'hypothetical' data in the above tables, it can be estimated that if the 'social tariff' was not available, Electrica's revenue would be higher by some 64 million dollars per year. The basis of this estimate is illustrated in the following table:

Appendix 3.3

Social Tariff: Estimated Annual Value of the Subsidy

Hypothetical sales less Actual sales = estimated cost of subsidy			
	'Lost revenue' for the month of June 2002 (ROL)		180,397,994,920
	'Lost revenue' for the month of June 2002 (ROL/ household using the 'social tariff')		51,875
Summaries in USD			
	USD:ROL Exchange rate applied		33,000
Hypothetical revenue 'Lost' by Electrica by running the 'social tariff' in June 2002			
Nationally (June 2002)			
	Hypothetical Sales (USD)	9,879,150	
	less Actual Sales (USD)	4,550,436	
	= 'Lost Sales' (USD)		5,328,714
Per 'social tariff' household (June 2002)			
	Hypothetical Sales	2.84	
	less Actual Sales	1.31	
	= 'Lost Sales'		1.53
Annual cost of running the subsidy			
	National 'lost sales' x 12 months (USD)		63,944,567
	'Lost sales' per social tariff household x 12		18.39

Appendix 3.4

Financial Impact of Termoelectrica Overcharging RADET for Heat

	Price as a result of the requirement to purchase heat from Termoelectrica.			Price if RADET was permitted to generate its own heat.		
	Price		% of supply price	Price		% of supply price
	ROL/ Gcal	USD/ Gcal		ROL/ Gcal	USD/ Gcal	
Heat price at plant gate	450,000	14.06	62%	300,000	9.38	52%
RADET's cost of operating the heat network	274,000	8.56	38%	274,000	8.56	48%
Total cost of heat supply	724,000	22.63	100%	574,000	17.94	100%
less direct subsidy	174,000	5.44	24%	24,000	0.75	4%
Household price at the time (National Reference Price)	550,000	17.19	76%	550,000	17.19	96%

Source: RADET, April 2002.

Appendix 3.5

Estimated District Heating Revenue (own Revenue + Subsidies), 2002

Budget for 2002 - estimated total revenue for district heating and budgeted direct subsidies for district heating companies					
	Revenue	**Subsidy**	**Revenue**	**Subsidy**	***Subsidy***
	Millions of ROL		**Millions of USD**		***%***
Q1	10,247,196	2,084,329	311	63	*20%*
Q2	3,678,481	846,431	111	26	*23%*
Q3	1,839,240	333,807	56	10	*18%*
Q4	10,509,945	1,515,433	318	46	*14%*
Total 2002	**26,274,862**	**4,780,000**	**796**	**145**	***18%***
Of which:					
Budgetary source:					
National (55%)		2,629,000		80	
Local (45%)		2,151,000		65	

Source: Ministry of Public Administration, 2002

Appendix 3.6

Municipal Budgets for 2001 and 2002 (Billions of ROL)

		Billions of ROL 2001		Billions of ROL 2002	
Input from state budget					
	Amounts from Income tax	22,497		27,414	
	Amounts from the income tax to balance the local budget	4,302		9,228	
	Amounts from income tax for the heating subsidy*	**2,509.7**		**2,151**	
	Amounts from VAT	22,013		31,219	
	Sub-total		51,321		70,012
State budget subsidies					
	For investments partially financed from foreign lending	1,500		1,900	
	For programs for persons with disabilities	1,749		0	
	For child protection programs	1,712		0	
	For general urban projects	9		37	
	For local airports	29		29	
	Sub-total		5,000		1,966
Income from local taxes			11,026		13,067
Income with special destination			3,564		4,223
Subsidies from other budgets			25		100
	TOTAL		**70,937**		**89,369**
*Notes. The exact budget for the Heating Subsidy for 2001 was 2,509.7 Billion ROL The exact budget for Heating Subsidy is for 2002 is 2,151 Billion ROL which represents 45% of the total heating subsidy budget for 2002 of 4,780 Billion ROL					

Source: FAC, 2002.

Appendix 3.7

Municipal Budgets for 2001 and 2002 (Millions of USD)

		Millions of USD 2001		Millions of USD 2002	
	Revenue	Subsidy	Revenue	Subsidy	Subsidy
Input from state budget					
	Amounts from Income tax	774		831	
	Amounts from the income tax to balance the local budget	148		280	
	Amounts from income tax for the heating subsidy	**86**		**65**	
	Amounts from VAT	757		946	
	Sub-total		1,766		2,122
State budget subsidies					
	For investments partially financed from foreign lending	52		58	
	For programs for persons with disabilities	60		0	
	For child protection programs	59		0	
	For general urban projects	0		1	
	For local airports	1		1	
	Sub-total		172		60
Income from local taxes			379		396
Income with special destination			123		128
Subsidies from other budgets			1		3
	TOTAL		2,441		2,708
Using exchange rates of $1:29,061 ROL for 2001, estimate $1:ROL 33,000 for 2002					

Source: FAC, 2002.

Appendix 3.8

Budget for HAP, 2000 – 2002

By calendar year	2000	2001	2002
USD (Millions)	21.8	24.4	32.2

Source: “The Weight of the Energy Bill in the Low-Income Family Budget”, APER, 2003.

Appendix 3.9

Breakdown of HAP Budget by Fuel

	Beneficiary Households			Monthly budget for November and December 2002.				Average payment per household	
	#	%		Bn ROL	USD (approx)	%		ROL	USD
Central systems	190,000	51.4		47	1,397,000	40.8		247,368	$7.35
Natural gas	23,000	6.2		3	89,000	2.6		130,435	$3.88
Solid fuel	157,000	42.4		65	1,931,000	56.5		414,013	$12.30
Total or average.		100		115	3,417,000	100		310,811	$9.24

The source of the number of households and budget data is “The Weight of the Energy Bill in the Low Income Family Budget”, Romanian Energy Policy Association, sponsored by USAID and ASE, 2003. This report in turn quotes Government Emergency Ordinance 121/2002 as the source of the data.

These data imply that the average payment for a household heating with solid fuels was $12.30, but the average payment for those heating with district heating and natural gas was $7.35 and $3.88 respectively. If these data are correct, it is unsurprising that households choose to heat with solid fuels rather than district heating or gas.

Appendix 3.10

Methodology for the Application and Allocation of HAP

METHODOLOGY

Concerning establishment and allocation of

Heat Assistance Payments (HAP) for poor people.

OUG-162/1999 provides the following methodology for allocating HAP:

1. HAP are allocated to households and single persons, only for their residence property or residence apartment.b

2. By household we mean husband, wife and other persons who have the same residence, as well as single person households.

3. The monthly HAP is function of the monthly net income per family member according to the levels provided by HG 723/2001, for delivering heat by district heating systems and the Government Ordinance that concerns heating with natural gas.

The criteria for establishing the net average income per household member are those provided by Art.6 of Law 67/1995.

4. The person entitled to receive the HAP is the owner or the tenant who is a party to the contract, or other major family member legally empowered by the owner or the tenant.

5. HAP is allocated at the entitled person's request, made on personal responsibility, on monthly basis, and is released only in the months that are subject of the effects of the Government Ordinance.

6. Requests for HAP should be registered at the Town Hall, or sub-municipality which responsible for the particular building.

7. Requests for HAP are made individually, or are submitted through Ownership or Tenant’s Associations, by the 25th of each month, based on evidence of income for the preceding month.

8. Town Halls have the obligation to validate the data in supporting documents and sends a Coupon, each month, to each interested person or association. The Coupon must contain the name of the person, the amount of HAP and the maximum amount for which the entitled person may benefit.

9. When individual heating bills have been received, or, when heat expenses have been allocated between households, the Owners associations, on a personal responsibility basis, should complete the column on the Coupon relating to the amounts owed to the Association by the beneficiaries.

If this amount owed is greater than the maximum amount specified in the Coupon by the Town Hall, the beneficiary must pay the difference between the value of the bill and the maximum amount specified in coupon. The payment should be made at the Owners (Tenants) Association or directly to the heat supplier.

10. Heat suppliers receive the amounts which relate to HAP from the local budgets of the town halls.

Appendix 3.11

HAP Rates and their Legal Basis

Legal instrument	Comment

HGR 1042/2000	**Set HAP rate for the start of winter 2000/01 (i.e., Nov - Dec 2000)**	
	(Exchange rate of 26,000 ROL/$1 applied). **Monthly income per household member** up to 0.6 MROL ($0 - $23.08) 0.6 - 0.75 MROL ($23.08 - $28.85) 0.75 - 1.0 MROL ($28.85-$38.46)	**Support for heating** 0.45 MROL ($17.31) 0.26 MROL ($10.00) 0.13 MROL ($5.00)

HGR of 26th January 2001 modifies HGR 1042/2000 as follows:	**HAP rate for end of the winter 2000/01 (i.e. Jan- March 2001)**	
	Lowered upper threshold, raised rate. (Exchange rate of 26,500 ROL/$1 applied). **Monthly income per household member** up to 0.7 MROL ($0 - $26.42) 0.7 - 0.85 MROL ($26.42 - $32.08) 0.85 - 1.1 MROL (($32.08 - $41.51)	**Support for heating** 0.51 MROL ($19.25) 0.3 MROL ($11.32) 0.15 MROL ($5.66)

Legal instrument	Comment

	Planned* HAP rates for start of winter of 2001/02 (Nov - Dec 2001)	
HG 723 of July 26th 2002	**Monthly income per household member** (Exchange rate of 32,000 ROL/$1 applied). up to 0.9 MROL ($0 - $28.13) 0.9 - 1.1MROL ($28.13- $34.38) 1.1 - 1.4 MROL ($34.38 - $43.75)	**District heating HAP** 0.8 MROL ($25.00) 0.48 MROL ($15.00) 0.24 MROL ($7.50)
* Not applied as the rates were modified by HG 932 2001 before winter commenced. These are the data from which the illustration from the Government website was constructed.		

	HAP rates for beginning of winter of 2001/2002 (i.e. the final months of 2001)	
OUG 115/2001	**Monthly income per household member** (Exchange rate of 31,500 ROL/$1 applied). up to 0.9 MROL ($0 - $28.57) 0.9 - 1.1MROL ($28.57- $34.92) 1.1 - 1.4 MROL ($34.92 - $44.44) 1.4 - 1.8 MROL ($44.44 - $57.14) ------ up to 0.9 MROL ($0 - $28.57) 0.9 - 1.1MROL ($28.57- $34.92) 1.1 - 1.4 MROL ($34.92 - $44.44)	**District heating HAP** 0.70 MROL ($22.22) 0.42 MROL ($14.29) 0.21 MROL ($6.67) 0.11 MROL ($3.49) **Natural gas HAP** 0.4 MROL ($12.70) 0.24 MROL ($7.62) 0.12 MROL ($3.81)
Note: OUG 115/2001 also passed responsibility for raising 45% of the HAP budget to local budgets. It had previously been fully-funded by central government.		

Legal instrument	Comment
OUG 162/1999	Ten-point methodology for application of HAP, reproduced separately in these appendices. Nominally expired on January 1st 2002, but was extended to include the final part of the winter of 2001/2002.

	HAP rates for end of winter 2001/02 (i.e. Jan - March 2002)	
UG 6/2002	(Exchange rate of 32,000 ROL/$1 applied) Note: Law 416/2001 now in force **Monthly income per household** up to 0.9 MROL ($0 - $28.13) 0.9 - 1.1 MROL ($28.13-$34.38) 1.1 - 1.4 MROL ($34.38-$43.75) 1.4 - 1.8 MROL ($43.75-$56.25) --------- up to 0.9 MROL ($0 - $28.13) 0.9 - 1.1 MROL ($28.13-$34.38) 1.2 - 1.4 MROL ($34.38-$43.75) --------- All households that qualify for social assistance payments and are not district heating or natural gas consumers.	**District heating HAP** 0.7 MROL ($21.88) 0.42 MROL ($13.13) 0.21 MROL ($6.56) 0.11 MROL ($3.44) **Natural gas HAP** 0.4 MROL ($12.50) 0.24 MROL ($7.50) 0.12 MROL ($3.25) **Cash HAP (coal etc)** 0.25 MROL ($7.81)

	HAP rates for beginning of winter 2002/03	
When this table was prepared, the new rates had been announced but had not yet been published in the Official Monitor.	(Exchange rate of 33,600 ROL/$1 applied) **Monthly income per household member** 0 -1.053 MROL ($0 - $31.34) 1.053 -1.287 MROL ($31.34 - 38.30) 1.287 -1.638 MROL ($38.30 - 48.75) 1.638 2.106 MROL ($48.75 - 62.68) --------- 0 - 1.053 MROL ($0.00 - 31.34) 1.053 - 1.287 MROL ($31.34 - 38.30) 1.287 - 1.638 MROL ($38.30 - 48.75) --------- All households that qualify for social assistance payments and are not district heating or natural gas consumers.	 **District heating HAP** 0.98 MROL ($29.17) 0.588 MROL ($17.50) 0.294 MROL ($8.75) 0.154 MROL ($4.58) **Natural gas HAP** 0.5 MROL ($14.88) 0.3 MROL ($8.93) 0.15 MROL ($4.46) **Cash HAP (coal etc)** 0.3 MROL ($8.93)

Source: www.mediauno.ro
Exchange rate of$1: ROL 33,600 was average for November and December 2002.

	HAP rates for end of winter 2002/03	
OUG 6/2003 which had been announced, but not yet published in the Official Monitor when this table was prepared.	(Exchange rate of 33,333 ROL/$1 applied) **Monthly income per household member** 0 - 0.75 MROL ($0 - $22.50) 0.75 - 1 MROL ($22.50 - 30.00) 1 - 1.25 MROL ($30.00 - 37.50) 1.5 - 1.75 MROL ($45.00 - 52.50) 1.75 - 2.106 MROL ($52.50 - 63.18) --------- 0 - 1.053 MROL ($0 - 31.59) 1.053 - 1.287 MROL ($31.59 - 38.61) 1.287 - 1.638 MROL ($38.61 - 49.14) --------- All households that qualify for social assistance payments and are not district heating or natural gas consumers.	**District heating HAP** 1.656 MROL ($49.68) 1.080 MROL ($32.40) 1.720 MROL ($21.60) 0.366 MROL ($10.98) 0.240 MROL ($7.20) **Natural gas HAP** 0.550 MROL ($16.50) 0.330 MROL ($9.90) 0.165 MROL ($4.95) **Cash HAP (coal etc)** New rates not yet known.

Notes:
The exchange rate $1: ROL 33,333 is typical of early 2003 (this table was prepared before the end of the winter, so an exact rate is not available).
The winter was severe, so Heat Assistance Payments for January - March 2003 were set higher than for November - December 2002.
Source: APER INFO Romania No. 74, February 2003

Appendix 3.12

HAP Illustration from the Romanian Government Website

The following text is translated directly from www.guv.ro, with USD figures being added at the rate of $1:32,000 ROL.

SIMULATIONS CONCERNING HEAT ASSISTANCE PAYMENTS

Assumptions:

1. The following average monthly incomes per household are analyzed:
2. The average monthly consumption per household is 1.334 Gcal corresponding to a total bill value of 733,700 ROL ($22.93).

Scenario 1 (the current scenario regulated by HG 723/2001)

[59]*Monthly net household income 1.5 MROL ($46.88)*

Single person	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Two persons	Average monthly income per person is 0.75 MROL ($23.44), which puts the household in the lowest income bracket. The household receives 0.8 MROL ($25), covering 100% of heating costs.
> Two persons	HAP also covers 100% of the cost of heating costs.

Monthly net household income 2.2 MROL ($68.75)

Single person	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Two persons	Average monthly income per person is 1.1 MROL ($34.48) which puts the household in the second lowest income bracket. The household receives 0.48 MROL ($15), covering 65.4% from the heating costs, paying the difference of 0.2537 ROL ($7.93).
> Two persons	Average monthly income per person puts this household in the lowest income bracket. HAP covers 100% of the cost of heating, meaning 0.8 MROL ($25).

[59] The thresholds and amounts described were never actually applied as HG 723/2001 of 26th July 2001 was modified by HG 923 of 20th September 2001 - i.e. before winter started.

Monthly net household income 3.0 MROL ($93.75)

Single person or two persons	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Three persons	Average monthly income per person is 1 MROL ($31.25) which puts the household in the second lowest income bracket. The household receives 0.48 MROL ($15), covering 65.4% of heating costs, paying the difference of 0.2537 MROL ($7.93).
Four or more persons	Average monthly income per person puts this household in the first income category. HAP covers 100% of the cost of the heat meaning an equivalent of 0.8 MROL ($25).

Monthly net household income 3.5 MROL ($109.38)

Single person or two persons	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Three persons	Average monthly income is 1.1 MROL ($34.38), which puts the household in the third lowest income bracket. The household receives 0.24 MROL ($7.5), covering 32.7% of heating costs, paying the difference of 0.4937 ROL ($15.43).
> Two persons	Average monthly income puts the household in the lowest income bracket. HAP covers 100% of the cost of heating, meaning an equivalent of 0.8 MROL ($25).

Scenario 2

Under this scenario, the lower limit of average monthly incomes per household taken into consideration is 1.8 MROL ($56.25)

Monthly net income per household 1.8 MROL ($56.25)

Single person	Average monthly income per person puts the household in the fourth (highest eligible) income bracket. Household receives HAP of 0.11 MROL ($3.44) covering 15% of the cost of heating, paying the difference of 0.623 MROL ($19.47).
Two persons or more	Average monthly income per person puts the household in the lowest income bracket. The household receives 0.7 MROL (21.88), covering 95.4% of heating costs.

Monthly net income per household 2.2 MROL

Single person	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Two persons	Average monthly income per person is 1.1 MROL ($34.38), which puts the household in the second lowest bracket. The household receives 0.42 MROL ($13.13), covering 57.2% of heating costs, paying the difference of 0.3137 MROL ($9.80).
> Two persons	Average monthly income per person puts the household in the lowest income bracket. The household receives 0.7 MROL ($21.88), covering 95.4% of heating costs, paying the difference of 33,700 ROL ($1.05)

Monthly net income per household 3.0 MROL

Single person or two persons	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Three persons	Average monthly income per person puts the household in the second lowest income bracket. The household receives 0.42 MROL ($13.13) covering 57.2% of heating costs, paying the difference of 0.3137 MROL ($9.80).
Four or more persons	Average monthly income per person puts the household in the lowest income bracket. The household receives 0.7 MROL ($21.88), covering 95.4% of heating costs, paying the difference of 33,700 ROL ($1.05).

Monthly net income per household 3.5 MROL

Single person or two persons	Average monthly income per person exceeds the limit provided for HAP so the household doesn't receive HAP.
Three persons	Average monthly income puts the household in the third lowest income bracket. The household receives 0.21 MROL ($6.56), covering 28.6% of heating costs, paying the difference of 0.5237 MROL ($16.37).
> Two persons	Average monthly income per person puts the household in the lowest income bracket. The household receives 0.7 MROL, covering 95.4% of heating costs, paying the difference of 33,700 ROL ($1.05)

Appendix 3.13

HAP Impact on Households with 'Average' Heat Bills, Winter 2001/2002

		Monthly	Daily	% of monthly income
Without HAP				
	Monthly income	$56.25	$1.81	
	Full heating bill	$22.93	$0.74	41%
	Income after heating	$33.32	$1.07	59%
With HAP				
	Monthly income	$56.25	$1.81	
	Full heating bill	$22.93	$0.74	41%
	less HAP	$3.44	$0.11	6%
	Net heating bill	$19.47	$0.63	35%
	Income after heating	$36.78	$1.19	65%

Appendix 3.14

HAP Impact on Households Average + 30% Heat Bills, Winter 2001/2002

		Monthly	Daily	% of monthly income
	Monthly income	$56.25	$1.81	
	Full heating bill	$29.81	$0.96	53%
	less HAP	$3.44	$0.11	6%
	Net heating bill	$26.37	$0.85	47%
	Income after heating	$29.88	$0.96	53%

Appendix 3.15

Indigenous Natural Gas Production and Imports, 1995 - 2001

Natural gas supply (BCM)	1995	1996	1997	1998	1999	2000	2001
Petrom	6.1	6.2	5.7	5.2	4.6	5.3	4.8
+ Romgaz	12.8	11.2	9.5	9.2	8.2	8.3	8.1
= Indigenous	18.9	17.4	15.2	14.4	12.8	13.6	12.9
+ Gazprom (imports)	6.0	7.0	5.0	4.7	3.2	3.3	2.9
Total natural gas	24.9	24.4	20.2	19.1	16.0	16.9	15.8
Natural gas supply (%)							
Indigenous production	76%	71%	75%	75%	80%	80%	82%
Imports	24%	29%	25%	25%	20%	20%	18%

Source: ANRGN

Appendix 3.16

Estimated Value of the Cross Subsidy for Natural Gas

		2000	2001	Source
Imported gas				
a	Estimated border price ($/thousand CM)	124	139	IMF
b	Imports (BCM/year)	3.3	2.9	ARNGN
c	Cost of imports (a x b) (millions of $/year)	409	403	
Indigenous gas				
d	Wellhead price ($/BCM/year)	35	43	IMF
e	Production (Millions of CM/year)	13.6	12.9	ARNGN
f	Cost of indigenous gas (d x e) (millions of $/year)	476	555	
Average of imported and indigenous gas				
g	Sum, annual imports + production (b + e) (BCM/y)	16.9	15.8	
h	Cost, imports + production (c + f) (millions of $/year)	885	958	
i	Weighted average border and wellhead prices (h / g) ($/thousand CM)	52	61	
Ratio of prices to weighted average price				
j	Imported/weighted average (a / i)	2.4	2.3	
k	Indigenous - weighted average (d / i)	0.67	0.71	
Actual household gas sales at subsidized prices				
m	National household gas consumption year (includes both cooking and heating). (BCM)	5	5	Estimate
n	Household gas price (actual) $/thousand cm	48.7	56.4	ARNGN
o	National revenue from household gas sales (m x n) (actual) (millions of $/year)	244	282	
Theoretical household gas sales at unsubsidized prices				
p	Household gas price if no subsidy was in place (j x n) $/thousand CM	115	129	
q	National revenue from household gas sales if no subsidy was in place (m x p) (millions of $/year)	576	647	
Theoretical cost of the natural gas subsidy				
r	National cost (q - o) (millions of $/year)	333	365	
s	Number of household gas connections* (millions of households).	2.5	2.5	Estimate
t	Approximate cost of the gas subsidy per household (r / s) ($/household/year)	133	146	

Source and assumptions: see notes.

Notes on the methodology used to calculate the value of the natural gas cross-subsidies to households.

There are various difficulties in calculating the value of this subsidy.

- Firstly, there is a paradigm in Romania that household gas is not subsidized at all as the industry is profitable. Nevertheless, from an economic perspective, the cross-subsidy between industry and households, and the sale of indigenous gas at well below international market prices are not only subsidies, but a poorly targeted subsidies that benefits rich households more than poor households. However, as a result of the absence of official recognition of the existence of the subsidy, there are no official statistics which describe its extent.

- Secondly, as there is no established methodology to calculate the extent to which end-user prices are subsidized, it has been necessary to create one. The methodology adopted has been to take the ratio of the weighted average price of imported gas at the border (border price) and indigenous gas at the wellhead (wellhead price) against the wellhead price alone, and apply this ratio to the end user price for households. Although this methodology does not take into account variations in transportation costs from Transylvanian basin and the Romanian border, or the extent to which household demand would contract as a result of a proper price signal, it is sufficiently accurate for the purposes of this study.

- Thirdly, calculating the value of the subsidy per household is difficult, as although there are some 350,000 residential contracts to supply natural gas, these include single contracts with the Ownership Associations for apartment building that using 'cooking gas'. The exact number of connections is not known, even by the gas industry, but discussions with industry participants suggest that 2.5 million households is a reasonable assumption.

Observations on the assumptions used to calculate the value to households of the cross-subsidy between imported and indigenous gas are most welcome.

Appendix 3.17

Romania - Implicit Subsidies for Natural Gas 2000 - 2003 (IMF)

		2000 Actual	2001 Actual	2002 Projected	2003 Projected
Loss from low prices - $ millions					
	Average import price - $/tcm	124	139	120	100
	Domestic wellhead price - $/tcm	35	35	43	43
	Domestic output - million tonnes	14	13	13	13
	Loss from low prices - $ millions	1,249	1,373	1,001	741
Loss from non-collection					
	Total supply - $ millions	566	993	1073	1170
	Collection rate	87%	81%	90%	95%
	Loss from non-collection - $ millions	74	189	107	59
Combined losses/implicit subsidy					
	Total losses (implicit subsidy) $ millions	1,322	1,561	1,108	800
	- as a % of GDP	3.6%	3.9%	2.5%	1.6%

Source: International Monetary Fund, August 2002

Appendix 3.18

Implicit Energy Subsidies (Including Non-Collection) 2000 - 2003

	Millions of USD			
	2000 Actual	2001 Actual	2002 Projected	2003 Projected
Electricity - operating loss (profit)	12	163	0	(29)
Heat - operating loss (profit)[60]	257	178	33	(33)
Electricity/heat non-collection	216	203	147	78
Gas - low prices	1,249	1,373	1,001	741
Gas - loss from non-collection	74	189	107	59
TOTAL	1,807	2,105	1,288	816
Total implicit subsidies as % of GDP	*4.9%*	*5.3%*	*2.9%*	*1.6%*

Source: International Monetary Fund, 2002

[60] Heat data are for Termoelectrica only, with the exception that projections for 2002/2003 include units that were externalized from the company during 2002. The exact source is Table:5 Romania - the Quasi-Fiscal Deficit in the Energy Sector, 2000 - 2003, from 'First and second reviews under the stand-by arrangements, request for wavers and modification of performance criteria' of August 13th 2002, which is available at www.imf.org

Appendix 4.1

Number, Age and Type of Households and Buildings

No. households	8 million		
No. residential buildings	4.6 million of which	>40 years old 20 - 40 years old < 20 years old	53% 37% 20%
		single family (mainly rural) apartment blocks (mainly urban) Multi-family but not apartment blocks	56% 39% 5%

Source: Energy Charter Secretariat PEEREA Review of Romania (Draft) 2002

Appendix 4.2

Financial Impact of Energy Efficiency When Energy Prices Were Low

Caveat: this table is from the early 1990s, when energy prices were much lower.

Energy efficiency measure	Energy savings (%)	Payback years based on 1990s energy prices)*
Improvement of thermal insulation		
additional insulation of doors, windows etc	4 - 10	below 4.5
ventilation control	4 - 9	below 3
additional insulation	25-50	4-10
Heating control	8	below 4
Improved maintenance	5 - 7	below 4.5
Implementation of individual measurement systems 13-15 below 4.5	13 - 15	below 4.5

Source: ICEMENERG/Royal Institute of International Affairs, 1994.

*An interesting things about the table is that it illustrates the high impact of appropriate energy pricing on energy efficiency. As extremely low prices of the early 1990s were used, payback estimates are correspondingly extremely high. For example, in 2002, payback for measure 'implementation of individual measurement systems' is typically quoted as "6 - 18 months" rather than "below 4.5 years" as quoted in the Icemenerg study. Paybacks can be expected to further reduce as energy prices continue to rise.

Appendix 4.3

Key Developments in Household Metering Legislation Since 1993

Government Decision 348 of July 20th 1993		
	Provision	Comment
Art 4	Creates a legal requirement to include both building and apartment level metering for new buildings.	This is a very good illustration of the weakness of the rule of law in Romania during the early 1990s. This Government Decision creates a clear legal requirement for utilities to install metering for heat and water, both at basement level and in apartments. But it simply didn't happen.
Art 7	Economic entities and public institutions shall procure and install measurement systems for water and heat no later than December 31st 1994. The costs of installation to be met by the consumers. In the case that installation is supported by the distribution operator, the costs should be recovered from the final consumer no later than three years from the date when the meters were installed.	

Law 199/2000 (Energy Efficiency Law)		
	Provision	Comment
Art 13 (2) c	Empowers ARCE to develop technical standards, norms and regulations for devices and equipment in buildings.	This was a new power for ARCE - which traditionally had a strong industrial focus.

Government Decision 29/2000 - Technical Rehabilitation of Buildings		
	Selected provisions	Comment
	It will not be possible to sell the apartment from 2005 if there is no meter installed.	This un-funded mandate is cleverly designed. It is unlikely to lead to universal metering by 2005, but should stimulate the market, and in the long-term - as all apartments change hands eventually - should lead to universal metering.

Government Decision 78/2001		
Art.	Selected provisions	Comment
	If a household installs volumetric metering, the Owners' Association must respect the reading on the meter and charge accordingly. A maximum of 10% of consumption for the building may be allocated on a per-person basis to take losses into account.	Until this Ordinance was passed, many Owners' Associations refused to take the meter reading into account, saying that it led to individual households paying less than 'their share' of the bill.
13 (2)	Secondary legislation based on Article 13 (2) above. States that individual residential consumers have a mandatory obligation to take action to install individual metering systems. *('Consumatorii de energie, persoane fizice, sunt obligati sa ia masuri pentru dotarea cu aparate de masura si control individuale.')*	There are four problems with this article, which would appear to create a legal obligation for households (physical persons) to install HCAs. First, it uses the word 'energie' which can be used to mean electrical energy only or all forms of energy, so it can be interpreted either way. Second, heat cost allocation is technically impossible unless the utility first fits a basement heat meter Third, there is no time limit for installing metering. Fourth there is no form of penalty for non-compliance.

Municipal Decision 41, 14 Feb. 2002, Bucharest Municipality. 'Concerning individual metering for cold and hot water and heat for residential consumers (tenants associations, owners association)		
Art.	Selected provisions	Comment
1.	Metering of each individual apartment becomes mandatory (in Bucharest)	Creates a clear requirement to meter.
3.	All new buildings to be designed for individual metering.	

Annex. 1 to Municipal Decision 41, 14th Feb. 2002 Bucharest Municipality. 'Regulations governing the metering of each individual apartment of both the owner's associations and tenant's associations for cold/hot water and heat consumption in the City of Bucharest'		
Art.	Selected provisions	Comment
1.	These regulations put into practice the mandatory requirement to install individual metering systems created by HGR-79/2001.	
2.	Apa Nova and RADET must install basement meters for every staircase.	Apa Nova is the water utility, RADET is the heat utility. Does not specify a deadline for implementation.
3.	Models of heat cost allocators must be approved by RADET.	Unnecessary provision with the potential to be abused.
4.	Metering companies must be approved by the metering office and by the heat or water utility.	The requirement for approval by the utility has the potential to be abused.
5.	The Owners' Association may charge no more than 10% of the metered consumption for 'common facilities'	Important provision which should prevent Owners' Associations from undermining the introduction of metering.
6.	Owners do not need permission or to pay a fee to the Owners' Associations for the use of meters.	Well-designed essential provision, as some Owners' Associations oppose the introduction of metering.
7.	Meter reading by an authorized heat company is paid by the building, not the individual.	
8.	Individual apartment metering may be made partially only for cold/hot water.	Open to wide interpretation. Does it mean that all apartments have to agree before heat cost allocators can be used? Or does it mean that it is possible to meter cold water use in the kitchen and pay a nominal amount for the bathroom?

Government Decision 73 of 28th August 2002.		
Art.	Selected provisions	Comment
	Basement heat metering becomes mandatory; Metering of each individual apartment is 'recommended'.	If the secondary legislation to accompany this ordinance solves the issue of how to allocate heat to non-participating households,

		this may become a key piece of legislation.

Appendix 4.4

Energy Efficiency Projects

This appendix provides more detail about projects reviewed briefly in Chapter 4 of this report. Information was gathered from a variety of sources, with descriptions of many of the older projects being taken from an EU Synergy report 'A Survey of Energy Co-operation in Romania' of September 1997.

The following categories of projects are reviewed:

- Household energy efficiency projects
- Energy efficiency projects in schools, hospitals, and social institutions
- Energy efficiency labeling
- Information and awareness
- Metering projects
- Stimulation of energy efficiency awareness
- Energy policy and price reform projects

Household Energy Efficiency Projects

'Energy Savings in Brasov'. The Danish Energy Agency (DEA) funded a demonstration/pilot project to carry out energy saving in buildings and environmental improvement in companies in the city of Brasov. In addition to work on the heat system, the effectiveness of thermostatic radiator valves was demonstrated during the winter of 1995/96 by fitting two identical blocks of flats with energy measuring devices and one of the blocks with the radiator valves. A separate but related project (also DEA funded) involved preparation of a District Heating Master-Plan Study for Brasov (June 1995). In addition, a program for entitled 'energy efficiency town twinning' twinned Brasov with Frederiksborg (Denmark) and Cork (Ireland), so a continuing relationship between Denmark and Brasov was created.

'Energy Savings in Buildings' was a project involving a household survey of energy use and practical measures in a Bucharest apartment building area. Objectives included: better evaluate the concern of the apartment owners with respect to energy, priority, behavior, readiness to undertake works for their apartment and/or their building; clearly identify the practical measures likely to be implemented on a broad scale taking account of the financial and technical resources available in Romania; demonstrate that these measures are cost-effective; to propose recommendations on the role and duty of the associations, a broad scale strategy for ARCE. Outputs include a household survey, energy diagnosis, no cost and low cost practical measures. The work was carried out during the mid-1990s funded under the EU PHARE 1992 Programme with a budget of approx. $150,000 by NOVEM (Netherlands)

'District Heating Improvement Study in Bucharest'. This project provided technical and financial/legal advice to RADET in the context of improving the energy efficiency of the entire Bucharest district heating network, including supply side and demand-side considerations. The initial project, value one million ECU ($1 million), was carried out during 1995 and 1996 by Danish consultants funded under the PHARE 1992 Programme. The results of this study have been the basis of a number of subsequent energy efficiency and rehabilitation projects by RADET, financed by a range of international donors and banks. The lead consultant for the original project (a Danish district heating expert) is still working with RADET in 2002, funded - at the suggest of the European Investment Bank (EIB) - from an EIB loan to RADET (which is reviewed in the financing section of this report).

'Heating Rehabilitation - The Impact of Metering in the City of Sibiu'. A pilot project to demonstrate the need for energy metering and help district heating decision-makers with their planning and implementation activities was carried out during the early 1990s by the French energy efficiency agency ADEME with a budget of approx. $102,000.

'Modernization of District Heating Systems and Buildings Insulation' supported ARCE and the Ministry of Public Works in the formulation and execution of energy efficiency policy; the municipalities in the discharge of their legal and civic responsibilities in this sector; and the district heating companies in the operation and planning of their district heating businesses. A number of small, manageable manuals dealing with all aspects of district heating management were prepared, with some aimed at technicians/engineers and others at managers/decision-makers. The project included a case study which deals with how best to approach dealing with a district heating network that is seriously degraded and has been expanded with little consideration of true costs. The work was financed under the EU PHARE 93 Programme in 1996, and was carried out by a German company with a budget of approx. $125,000 Euro.

Energy Efficiency Projects in Schools, Hospitals, and Social Institutions

'Installing CFLs in Budgetary Institutions - a DSM Action' was carried out in 1998 by the national power distribution monopoly, funded from internal sources. Following a public tender, 100,000 OSRAM 21W CFLs were installed in schools, hospitals, orphanages, old folks' homes and other social institutions, replacing 100W incandescent lamps. Monitoring concluded that 88,500 of the lamps had been mounted effectively. According to a highly detailed technical paper[61] on the impact of this action, the results for consumers were maintained (but not improved) visual comfort levels and reduced lighting costs representing a combined total of 13,500 MWh per year. For the power company, the benefits were a fuel cost reduction of 1.5 million dollars per years; a reduction of 7MW off peak demand; and an improvement in its public image.

'Thermal Rehabilitation of Housing Buildings at the University of Iasi' was carried out in 1996, funded jointly by the 1993 PHARE Energy Programme and the 1996 EU Ecos-

[61] 'Montarea de LFC La Unii Consumatori Bugetari - O Actiune DSM' by Camelia Burlacu, SC Electrica SA, Bucharest.

Ouverture Urban and Regional Energy Efficiency Programme. The towns of Iasi (Romania) and Epernay (France) became 'energy twin towns' under the program.

'Energy Use and Savings in Schools' demonstrated energy efficiency measures in four schools and prepared a strategy with relevant institutions. The project was carried out in 1997/98 under the PHARE Energy 1995 Programme with a budget of some $200,000. The measurable results[62] were as follows: School 1: Replacement of an old and inefficient oil fire boiler. This high-cost measure was expected to save around 250 MWh/year (almost 11 percent of the costs) providing annual savings of more than 7,000 Euro, returning a simple payback in 6.5 years. School 2: Modernization of the lighting system through the replacement of 72 lighting units. The provision of similar lighting levels would save approximately 30 percent (950 Euro) which would produce a simple payback of just over 3 years. School 3: Rehabilitation of an oil fired heating system. This high-cost measure was expected to save 20,151 kg of fuel oil per year resulting in annual financial savings of more than 14,000 Euro, which provides a simple payback in just over 3 years. The installation of approximately 520 square meters of replacement windows was expected to reduce heat losses by 50 percent and save approximately 5,700 Euro annually which would reimburse the investment in just 3.4 years. School 4: 535 square meters of replacement windows at this school were expected to reduce heat losses by up to 43 percent, saving less than 3,000 Euro per year and resulting in a payback period of more than 6 years. It was noted that these results would not be achieved since all the schools needed to sacrifice some of these energy savings in order to increase their levels of thermal comfort.

'Energy Audits and Buildings in the Tertiary Sector' involved audit reports for each of eight buildings, bringing energy savings opportunities to the attention of the owners and tenants, and on-the-job training for the Romanian partners. Beneficiaries were two hospitals, two educational buildings, two hotels and two office buildings, located in four cities. The budget, under the PHARE 92 Programme, was approximately $50,000.

'Energy Efficiency in the Health Sector' demonstrated the scope for energy conservation in hospitals, and included rehabilitation plans/energy audits in four hospitals, with short and medium term energy saving plans for three of the hospitals and a detailed study for the fourth; a co-financed implementation of some of the measures identified, with the balance being funded by the Ministry of Health; and nationwide energy efficiency program for the health sector, which was prepared jointly with the administration concerned and ARCE. The project was carried out during 1996/97 under the PHARE Energy 1993 Programme by Greek consultants with a budget of approximately $200,000.

According to a report on the web site of the Ministry of Industry and Resources[63], the concrete results of the above project were as follows. Hospital 1: (High Cost) - Total

[62] Source: 'PHARE Energy Projects in Romania', 1999, as published on the Ministry of Industry and Resources' website, www.minind.ro. For broad illustration purposes, it is reasonable to assume parity between the dollar and the euro.

[63] Source: www.minind.ro. Rounded dollar amounts have been added, based on the Romanian National Bank's annual average exchange rate for 1997 of ROL 7,168: 1 USD.

refurbishment of the boiler room resulting in an overall energy saving of approximately 20 percent, representing 16 million ROL (1997 - so around $2,200), significantly increased levels of comfort and a simple payback of 7.5 years. Hospital 2: (Low Cost) - Partial draught proofing, installation of steam traps and the rehabilitation of the condensate return system resulted in a reduction in the use of heating oil by 33 percent, savings of 246 million ROL (1997 - about $34,000) and a simple payback of less than one year. Hospital 3: (Low Cost) - Partial draught proofing, installation of external temperature compensation on the district heating heat exchangers (space heating) and the installation of a temperature controller on the domestic hot water heat exchangers resulted in an 8 percent energy saving for space heating during the project's final reporting period. Greater savings were expected from the compensation for the domestic hot water system. Hospital 4: (Medium Cost) - Improved fuel supply to the boiler network, the installation of fuel filters, fuel pre-heaters and replacement fuel nozzles, together with the installation of a closed expansion tank, replacement circulation pumps and automatic riser vents reduced energy consumption by approximately 18 percent, representing 412 million ROL (1997, about $57,500). The average room temperature increased by 1 - 2 degrees Celsius.

Energy Efficiency in Institutions. A component of an EU PHARE project carried out in 2001 included sending an energy engineer/economist[64] to visit the sites of a number of energy efficiency investments in schools, hospitals and children's homes that had been planned some time earlier but were still technically and economically relevant. One of the results of the project was a wealth of technically possible and economically attractive investments in this sector that are not being exploited at the present time.

Energy Efficiency Labeling

'Legal Framework and Regulations for Standardization and Labeling of Energy Performances of Household Appliances'. The approach of the EU to improving the energy efficiency of household appliances is not to create maximum power consumption standards (which is the US approach), but to make the display of prominent labels which describe the efficiency of the appliance mandatory. Refrigerators are rated from 'A' - best, i.e. a highly efficient refrigerator - to 'G' - the worst rating. This approach has worked well over time, as consumers do not want to buy refrigerators carrying a label which says - to all intent and purposes - 'this is a bad refrigerator', so the manufacturers now produce energy efficient refrigerators as a matter of choice - most of the models on the market are now 'A' or 'B' rated. At the time of this project, energy efficiency labeling was relatively new in Europe and completely new in Romania. The project improved awareness of energy efficiency labeling issues, and drafted legal text to incorporate the EU Directives into Romanian national law. The project was very successful. A Government Decision on the labeling of appliances was taken in 1996, and as a result energy efficiency labeling of white goods is now standard practice in Romania.

[64] Source: conversation with the individual who carried out the work, which was not an energy sector project so was not included in the energy efficiency project information requested from the EU.

Energy Efficiency Labeling of Buildings will be introduced in 2005. The labeling system will be based on the appliance labeling system, and rate buildings between 'A' (most efficient) and 'J' (least efficient). Separate ratings will be provided for space heating efficiency and hot water (washing water) efficiency. The legal basis for this measure is Government Ordinance 29/2000.

Information and Awareness

'Energy Efficiency Law'. USAID and World Learning co-funded a successful development and promotional campaign for an energy efficiency law. The objective was to take over the concept of an energy efficiency law, which had been around in several draft forms from as far back as 1993, but which had consistently failed to win the attention or support of successive governments. The scope of the law was to help reduce energy intensity, improve industrial competitiveness, meet environmental targets, improve security of supply and improve quality of energy services. A series of events created awareness of energy efficiency legislation issues, and a draft Law was developed and promoted. The project, which was carried out by the Romanian Energy Policy Association with a budget of $16,000 was extremely successful, resulting in the Energy Efficiency Law (Law 199/2000).

'Compact Fluorescent Lamps (CFL) Awareness'. According to the national distribution company Electrica, information/publicity provided by Philips and Osram about CFLs are sometimes distributed with household electricity bills. (Note: this is the exception rather than the rule. The 'bill stuffers' concept has not yet caught hold in Romania).

'Catalogue of Metering Equipment' involved preparation of a catalogue on metering, measurement, control and monitoring equipment available in Romania. The objectives were to increase the capabilities of ARCE in preparation of documentation and in organization, and to disseminate two hundred copies of the resulting catalogue to industrial consumers, technical staff of local authorities, design and project institutes and other institutions, architects, constructors, etc. The project was carried out in the mid- 1990s under the PHARE 92 Program with a budget of around $30,000.

An 'Energy Cities Network' was started under the EU's PHARE 1992 Energy Programme and received additional funding from mid-1996 under the PHARE 1993 GTAP Programme. The project created a link between municipalities, with the objective of promoting direct exchanges among officials and people in charge of local and regional energy policies; setting up joint projects on energy planning and energy efficiency programs; providing information on technologies, operations, etc; and facilitating local and international co-operation. The initial budget was 50,000 ECU ($50,000) and the follow-up an additional 175,000 ECU ($175,000).

'Nationwide Energy Efficiency Awareness Campaign'. The objectives of the project were to mobilize several specialized bodies (ministries, organizations, businesses, institutes) to take part in an information campaign; increase consumer awareness of energy conservation issues and methods; prepare information and communication tools for different sectors (industry, residential, transport etc.); and organize events and activities focusing on energy conservation and energy efficiency. The campaign included mass-media advertising through TV, newspapers and leaflets. The project was carried out by

a Greek consulting company with a budget of around $230,000 provided by the EU's PHARE 1993 Programme. Leaflets were distributed to households during the autumn of 1996. The awareness campaign project was originally intended to coincide with the launching of a proposed Energy Efficiency Law, which finally happened four years after the project ended, and a National Energy Conservation Program which now - five or six years later- remains at the discussion stage.

The UNESCO Masters Degree in Energy Auditing was launched for 15 graduate students at the UNESCO Chair of Engineering Sciences, Energy-Environment Program at Bucharest Politehnica University in the academic year 2002-03.

Metering Projects

'Botosani HCA/TRV project'. According to Danfoss, a project carried out in the town of Botosani represents one of the best examples of the impact of HCA/TRV bundles, as two identical staircases in the same building participated so a direct comparison is possible. The staircase which was fitted with HCA/TRV reduced its overall heat bill by 30 percent, with some households saving more and others less.

'Foundation for Civic Action' failed to install heat cost allocators at an apartment building in Bucharest as they could not achieve universal agreement by all households. This failed project demonstrated the need for norms that allow for majority decision-making on the use of these technologies. Such norms are now in place (in Bucharest).

'HCA/TRVs in Five Towns'. EU PHARE is planning to install HCA/TRV bundles in five towns in a 5 million Euro project to be carried out in 2004. A further 5 million Euro is earmarked for a follow-on project with a similar scope.

Stimulation of Energy Efficiency Markets

'USAID Energy Efficiency Market Development Program 1994 - 1996'. The objective of this project was to serve as a catalyst to accelerate the development of a market for an energy efficiency industry and to assist firms in the private sector to develop their capability to serve this market. Activities included training in energy efficiency for private sector engineers on market-orientated business subjects, establishment of a local chapter of the Association of Energy Engineers (AEE), energy management programmes in representative facilities and a conference and exhibition. The 12 small Romanian energy efficiency companies which were trained under the project by consultants Hagler Bailey were Arcon SRL; Automatizari Orion; Best; B.I.T. SRL; Camigo SRL; Consel SRL; EC-Energ SRL; Eco-ERG SRL; Eco-Vel SRL; Electron TD SRL; Energochim SRL; G.I.R. SRL; Invest Proiect SRL; Probelectro SRL; Projecta SRL; Robomatic SRLA. A brief review in 2002 revealed that some of the companies have developed into successful energy efficiency businesses, but focus on the industrial sector (so are not of specific relevance to this study). In addition, the Chapter of the AEE which was seeded by USAID is still active in 2002.

Energy Efficiency Projects Selection Technical Assistance was carried out by consultants Harza Engineering and Montgomery Watson for USAID in 2000. Seventeen

municipalities were analyzed, with a view to making judgments on whether proposed projects for financing were viable. The full report is available online at www.dec.org.

Energy Policy and Price Reform Projects

'Energy Efficiency Price Reform' was an early USAID project, carried out under the 1991-1992 Emergency Energy Action Program. The project was carried out by Resource Management Associates of Madison and included research, modeling, a workshop and a set of recommendations to the Government of Romania and other international donors and lenders. The project is often considered to represent the turning point at which time Romania began to introduce a rational energy pricing policy. Key recommendations included price reform based on long-run marginal costs, regulatory reform leading to the creation of a fully independent regulatory body and several other reforms. With the benefit of hindsight, it can be seen that the report became a blueprint for a large number of reforms and projects which were carried out by successive governments and the multilateral and bilateral cooperation communities over the following decade.

'High-Level Energy Policy and Legislation Advisor to Romania' was an EU SYNERGY Project which was carried out between 1994 and 1997, involving the development of policy and legislation, training and awareness and institutional strengthening centered around the energy-related departments of the Ministry of Industry and Trade. A similarly titled EU PHARE Project 'High-Level Energy Policy Advisor to Romania' provided management support for successive EU PHARE Energy Programmes, continuing in a variety of formats between 1994 and 2002.

Appendix 5.1

Progress of IMF Plans to Raise Energy Prices, 2001 - 2003

End-user electricity prices			Notes	Heat producer prices for Termoelectrica ($/Gcal)		Notes
	Oct 1, 2001	3.6%	1,3	Oct 1, 2001	15.00	1,3
	Nov 1, 2001	3.6%	2,3	Jan 1, 2002	15.00	2,3
	Dec 1, 2001	3.6%	2,3	Apr 1, 2002	15.00	1,3
	Jan 1, 2002	3.6%	2,3	Jul 1, 2002	15.00	1,3
	Feb 1, 2001	3.6%	2,3			
	Mar 1, 2002	3.6%	2,4	National Reference Price for Heating ($/Gcal)		
	Apr 1, 2002	14%	1,3	Jan 1, 2002	15.4	2,3
	Jul 1, 2002	1.5%	1,3	Apr 1, 2002	15.4	1,3
	Oct 1, 2002	Adjustment to keep price constant in dollar terms.		Jul 1, 2002	20.0	1,3
	Jan 1, 2003					
	Jul 1, 2003			Unified end-user natural gas prices ($/thousand M3).		
				Oct 1, 2001	82.5	1,3
Electricity producer prices, Termoelectrica ($/MWh)				Jan 1, 2002	82.5	1,3
	Apr, 2002	39.00	1,3	Apr 1, 2002	82.5	1,3
	Jul 1, 2002	39.00	1,3	July 1, 2002	82.5	1,3
	Oct 1, 2002	39.00	2	Oct 1, 2002	82.5	2
	Jan 1, 2002	39.00	1	Jan 1, 2003	90.0	1
	Apr 1, 2002	39.00	1	Apr 1, 2003	90.0	1

Notes to this table		
	1	Indicative/target
	2	Structural performance criteria
	3	Implemented
	4	Not observed

Source: Government of Romania/International Monetary Fund, August 2002

Appendix 5.2

Household Electricity Prices, Jan 1991 - Jul 2002, ROL/MWh

	1991	1992	1993	1994	1995	1996
Jan	650	650	6,000	28,000	40,000	46,000
Feb	650	650	6,000	28,000	40,000	46,000
Mar	650	650	6,000	28,000	40,000	46,000
Apr	650	650	6,000	37,600	40,000	46,000
May	650	3,208	28,000	40,000	40,000	177,188
Jun	650	3,700	28,000	40,000	43,500	177,188
Jul	650	3,700	28,000	40,000	46,000	177,188
Aug	650	3,700	28,000	40,000	46,000	177,188
Sep	650	6,000	28,000	40,000	46,000	177,188
Oct	650	6,000	28,000	40,000	46,000	177,188
Nov	650	6,000	28,000	40,000	46,000	177,188
Dec	650	6,000	28,000	40,000	46,000	177,188
An.Ave.	650	3,409	20,667	36,800	43,292	133,459
	1997	1998	1999	2000	2001	2002
Jan	177,188	187,030	376,191	800,000	1,146,357	1,604,213
Feb	177,188	187,030	411,382	800,000	1,146,357	1,656,209
Mar	177,188	187,030	480,387	800,000	1,146,357	1,672,577
Apr	177,188	187,030	480,387	800,000	1,184,584	1,903,477
May	177,188	263,626	480,387	800,000	1,228,273	1,903,477
Jun	177,188	300,100	671,901	902,127	1,337,245	1,903,477
Jul	177,188	300,100	739,796	1,035,679	1,391,731	1,951,456
Aug	177,188	300,100	739,796	1,098,396	1,391,731	
Sep	177,188	300,100	739,796	1,146,357	1,391,731	
Oct	177,188	376,191	771,905	1,146,357	1,441,833	
Nov	187,030	376,191	800,000	1,146,357	1,504,861	
Dec	187,030	376,191	800,000	1,146,357	1,553,563	7 mth ave
An.Ave.	178,828	278,393	624,327	968,469	1,322,052	1,799,269 [65]

Source: ANRE

[65] 'Annual average' for 2002 is based on January - July figures.

Appendix 5.3

Household Electricity Prices, Jan 1991 - Jul 2002, US cents/kWh

	1991	1992	1993	1994	1995	1996
Jan	1.9	0.3	1.3	2.0	2.3	1.8
Feb	1.9	0.3	1.2	1.9	2.2	1.7
Mar	1.8	0.3	1.0	1.7	2.2	1.6
Apr	1.1	0.3	1.0	2.3	2.1	1.6
May	1.1	1.4	4.5	2.4	2.1	6.0
Jun	1.1	1.4	4.1	2.4	2.2	5.9
Jul	1.0	1.1	3.6	2.4	2.3	5.8
Aug	1.1	1.0	3.5	2.4	2.2	5.6
Sep	1.1	1.5	3.2	2.3	2.2	5.5
Oct	1.1	1.4	2.8	2.3	2.1	5.4
Nov	0.3	1.4	2.6	2.3	1.9	5.1
Dec	0.3	1.4	2.5	2.3	1.8	4.7
An. Ave.	0.8	1.1	2.7	2.2	2.1	4.3
	1997	1998	1999	2000	2001	2002
Jan	3.6	2.3	3.3	4.4	4.4	5.0
Feb	2.6	2.3	3.4	4.3	4.3	5.1
Mar	2.4	2.3	3.4	4.2	4.2	5.1
Apr	2.5	2.2	3.2	4.0	4.2	5.8
May	2.5	3.1	3.2	3.9	4.3	5.7
Jun	2.5	3.5	4.3	4.3	4.6	5.7
Jul	2.5	3.4	4.6	4.8	4.7	5.9
Aug	2.4	3.4	4.6	4.9	4.7	
Sep	2.4	3.3	4.5	4.9	4.6	
Oct	2.3	4.0	4.6	4.7	4.7	
Nov	2.4	3.8	4.6	4.6	4.8	
Dec	2.3	3.6	4.4	4.5	4.9	
An. Ave.	2.5	3.1	4.1	4.5	4.5	5.5[66]

Source: ANRE/Romanian National Bank.

[66] 'Annual average' for 2002 is based on January - July figures.

Appendix 5.4

Household Electricity Tariffs, July 2002 and Jan 2003

		Tariff name	**July 2002 ROL and US cents when converted at $1:ROL 33,000**		**January 2003 ROL and US cents when converted at $1:ROL 33,500**	
			ROL	USc	ROL	USc
1	CS	The 'social tariff' (inverted block tariff)	1,339 ROL/kWh below 60 kWh/month 5,759 ROL/kWh above 60 kWh/month	4.1 17.5	1,362 ROL/kWh below 60 kWh/month 5,856 ROL/kWh above 60 kWh/month	4.1 17.5
2	CD	'Straight commodity charge' tariff	2,840 ROL/kWh	8.6	2,888 ROL/kWh	8.6
3	CA	'Standard Tariff' with Capacity charge + commodity charge	Capacity charge of 1,044 ROL/day Commodity charge of 2,106 ROL/kWh	3.2 6.4	Capacity charge of 1,060 ROL/day Commodity charge of 2,141 ROL/kWh	3.2 6.4
4	CA2	'Two time zone' tariff	Capacity charge of 1,044 ROL/day Commodity charges of 2,560 ROL/kWh (day) 1,662 ROL/kWh (night)	3.2 7.8 5.0	Capacity charge of 1,060 ROL/day Commodity charges of 2,604 ROL/kWh (day) 1,690 ROL/kWh (night)	3.2 7.8 5.0
5	CA3	'Three time zone' tariff	Capacity charge 1,044 ROL/day Commodity charges of 4,212 ROL/kWh (peak) 2,106 ROL/kWh (day) 1,662 ROL/kWh (night)	3.2 12.8 6.4 5.0	Capacity charge 1,060 ROL/day Commodity charges of 4,283 ROL/kWh (peak) 2,141 ROL/kWh (day) 1,690 ROL/kWh (night)	3.2 12.8 6.4 5.0

Note: this table illustrates that the price increase of December 27th 2002 was only to 'catch up' with a decline in the value of the leu against the dollar since the previous tariff increase of July 1st 2002. When expressed in USD, the tariffs are unchanged.

Source: ANRE, 2003

Appendix 5.5.

National Reference Price for District Heating (Payable by Households)

	NRP ROL/Gcal	ROL/USD exchange rate in month when introduced	ROL/USD Exchange rate in month when withdrawn	Value when introduced $/Gcal	Value when withdrawn $/Gcal
18May 1999	156,000	15,238	16,706	10.24	9.34
19 Oct 1999	230,000	16,706	23,602	13.77	9.74
01 Oct 2000	350,000	24,538	29,809	14.26	11.74
01 Sep 2001	550,000	30,236	31,556	18.19	17.43
01 Jan 2002	575,000	32,052	32,766	17.94	17.55
01 Apr 2002	600,000	33,102	33,392	18.13	17.97
01 Jul 2002	800,000	32,979		24.26	

Note: prices from 2000 include VAT

Sources: ANRE Annual Report 2001, Annex 15;
APER Info Romania No. 66, June 2002; and
Romanian National Bank.

Appendix 5.6

RADET's Household Heat Prices, Jan 1991 - Aug 2002, ROL/Gcal

	1991	1992	1993	1994	1995	1996
Jan	505	2,760	5,412	9,811	17,240	25,526
Feb	505	2,760	5,412	11,235	17,240	25,526
Mar	513	2,760	5,412	11,235	17,240	25,526
Apr	585	2,760	5,412	11,235	17,240	25,526
May	585	2,760	6,115	11,235	17,240	25,526
Jun	623	2,760	8,425	11,235	17,240	25,526
Jul	902	2,931	8,647	16,659	22,176	25,526
Aug	939	5,412	8,900	17,240	22,284	40,539
Sep	939	5,412	8,900	17,240	25,526	40,539
Oct	939	5,412	8,900	17,240	25,526	40,539
Nov	2,032	5,412	8,900	17,240	25,526	40,539
Dec	2,760	5,412	8,900	17,240	25,526	40,539
An.Ave.	986	3,879	7,445	14,070	20,834	31,781
	1997	1998	1999	2000	2001	2002
Jan	40,539	114,146	170,717	317,200	451,745	689,036
Feb	40,539	114,146	193,302	317,200	451,745	689,036
Mar	41,560	114,146	211,901	317,200	451,745	689,036
Apr	72,179	114,146	211,901	317,200	451,745	689,036
May	72,179	114,146	211,901	317,200	451,745	689,036
Jun	72,179	114,146	256,974	317,200	451,745	689,036
Jul	72,179	114,146	277,071	317,200	451,745	689,036
Aug	72,179	114,146	277,071	317,200	451,745	
Sep	72,179	114,146	277,071	317,200	451,745	
Oct	72,179	170,717	277,071	451,745	451,745	
Nov	114,146	170,717	317,200	451,745	518,805	
Dec	114,146	170,717	317,200	451,745	682,728	
An.Ave.	71,349	128,289	249,948	350,836	476,582	

Source:RADET and Romanian National Bank

Note: Households do not pay these prices - they pay the National Reference Price.

Appendix 5.7

RADET's Household Heat Prices, Jan 1991 - Aug 2002, US$/Gcal

	1991	1992	1993	1994	1995	1996
Jan	14.43	14.15	11.51	7.07	9.71	9.82
Feb	14.43	13.94	10.59	7.52	9.58	9.20
Mar	14.25	13.94	9.24	7.02	9.41	8.88
Apr	9.75	13.94	8.96	6.72	9.24	8.77
May	9.75	12.32	9.85	6.78	9.02	8.71
Jun	10.21	10.57	12.25	6.74	8.81	8.54
Jul	14.55	8.40	11.24	9.88	11.12	8.33
Aug	15.39	14.43	11.00	10.21	10.89	12.89
Sep	15.39	13.40	10.23	9.98	12.16	12.66
Oct	15.65	12.59	9.04	9.83	11.78	12.30
Nov	10.06	12.59	8.33	9.81	10.66	11.66
Dec	14.84	12.50	7.80	9.72	9.98	10.86
An.Ave.	12.81	12.59	9.80	8.50	10.25	10.31
	1997	1998	1999	2000	2001	2002
Jan	8.17	13.76	15.04	17.28	17.21	21.50
Feb	5.88	13.87	15.75	16.96	16.85	21.38
Mar	5.74	13.91	15.08	16.51	16.55	21.03
Apr	10.24	13.62	14.32	16.05	16.20	20.82
May	10.18	13.47	13.91	15.55	15.85	20.57
Jun	10.06	13.32	16.31	15.08	15.60	20.63
Jul	10.08	13.12	17.40	14.68	15.38	
Aug	9.69	13.00	17.21	14.15	15.15	
Sep	9.59	12.61	16.94	13.44	14.94	
Oct	9.37	18.20	16.59	18.41	14.67	
Nov	14.62	17.23	18.18	18.00	16.58	
Dec	14.34	16.21	17.63	17.64	21.64	
An.Ave.	9.95	14.45	16.30	16.17	16.40	

Source: RADET, converted with Romanian National Bank rates.

Includes VAT from 1999 when introduced for household heating.

Note: in recent years households have actually paid the National Reference Price

Appendix 5.8

Household Natural Gas Prices 1991 - 2002, ROL/thousand cm

	1991	1992	1993	1994	1995	1996
Jan	2,800	2,800	3,700	24,000	34,000	40,000
Feb	2,800	2,800	3,700	24,000	34,000	40,000
Mar	2,800	2,800	3,700	24,000	34,000	40,000
Apr	2,800	2,800	3,700	34,000	34,000	40,000
May	2,800	3,700	24,000	34,000	34,000	40,000
Jun	2,800	3,700	24,000	34,000	40,000	40,000
Jul	2,800	3,700	24,000	34,000	40,000	63,000
Aug	2,800	3,700	24,000	34,000	40,000	63,000
Sep	2,800	3,700	24,000	34,000	40,000	63,000
Oct	2,800	3,700	24,000	34,000	40,000	63,000
Nov	2,800	3,700	24,000	34,000	40,000	63,000
Dec	2,800	3,700	24,000	34,000	40,000	63,000
An. Ave.	2,800	3,400	17,233	31,500	37,500	51,500
	1997	1998	1999	2000	2001	2002
Jan	63,000	230,000	450,000	900,000	1,272,000	2,751,375
Feb	63,000	230,000	575,000	900,000	1,272,000	
Mar	147,000	230,000	575,000	900,000	1,272,000	
Apr	147,000	230,000	575,000	900,000	1,272,000	
May	147,000	230,000	575,000	900,000	1,272,000	
Jun	230,000	230,000	900,000	900,000	1,272,000	
Jul	230,000	355,000	900,000	1,100,000	1,272,000	
Aug	230,000	355,000	900,000	1,100,000	2,417,000	
Sep	230,000	355,000	900,000	1,272,000	2,417,000	
Oct	230,000	450,000	900,000	1,272,000	2,538,855	
Nov	230,000	450,000	900,000	1,272,000	2,538,855	
Dec	230,000	450,000	900,000	1,272,000	2,538,855	
An. Ave.	230,000	316,250	754,167	1,057,333	1,587,143	

Source: ARNGN

Appendix 5.9

Household Natural Gas Prices 1991 - 2002, $/thousand cm

	1991	1992	1993	1994	1995	1996
Jan	80.0	14.4	7.9	17.3	19.1	15.4
Feb	80.0	14.1	7.2	16.1	18.9	14.4
Mar	77.8	14.1	6.3	15.0	18.5	13.9
Apr	46.7	14.1	6.1	20.3	18.2	13.7
May	46.7	16.5	38.6	20.5	17.8	13.7
Jun	45.9	14.2	34.9	20.4	20.4	13.4
Jul	45.2	10.6	31.2	20.2	20.1	20.6
Aug	45.9	9.9	29.7	20.1	19.6	20.0
Sep	45.9	9.2	27.6	19.7	19.0	19.7
Oct	46.7	8.6	24.4	19.4	18.5	19.1
Nov	13.9	8.6	22.5	19.4	16.7	18.1
Dec	15.1	8.5	21.0	19.2	15.6	16.9
An. Ave.	36.4	11.0	22.7	19.0	18.4	16.7
	1997	1998	1999	2000	2001	2002
Jan	12.7	27.7	39.6	49.0	48.5	85.8
Feb	9.1	27.9	46.9	48.1	47.4	
Mar	20.3	28.0	40.9	46.9	46.6	
Apr	20.9	27.4	38.9	45.5	45.6	
May	20.7	27.1	37.7	44.1	44.6	
Jun	32.1	26.8	57.1	42.8	43.9	
Jul	32.1	40.8	56.5	50.9	43.3	
Aug	30.9	40.4	55.9	49.1	81.1	
Sep	30.5	39.2	55.0	53.9	79.9	
Oct	29.9	48.0	53.9	51.8	82.5	
Nov	29.5	45.4	51.6	50.7	81.1	
Dec	28.9	42.7	50.0	49.7	80.5	
An. Ave.	32.1	35.6	49.2	48.7	54.6	

Source: ARNGN/Romanian National Bank

Appendix 5.10

Financial Impact of the Inverted Block Tariff for Natural Gas in 2002

Household	Benefit - ROL per month	Benefit - USD per month	No. Months	ROL	USD
Summer	80,000	2.42	x 6	480,000	14.54
Winter	245,600	7.44	x 6	1,473,600	44.65
Value of subsidy for one year				1.953,600	59.20
No. Beneficiary households		675,000			
Total annual cost of subsidy			1,318,680,000,000		39,960,000

Exchange rate applied: 1 USD: 33,000 ROL

Appendix 6.1

Illustration - The Scale of Various Energy Subsidies

Subsidy	Source	Annual cost $ millions
Electricity - optional inverted block tariff	Cross subsidy between household electricity tariffs[67]	64
Implicit subsidy - cost of non-collection for electricity and heat. Source IMF.	Average of $78 million in 2000, $189 million in 2001, $147 estimated for 2002 and $78 million estimated for 2003	123
Implicit subsidy - operating loss in for heat (includes industrial and residential heat). Source IMF.	Average of $257 million in 2000 and $178 million in 2001. IMF forecasts this will reduce to $33 million in 2002 and a profit of $33 million in 2003, but this remains to be seen. Average of the first three years only used for this illustration.	156
Heat - direct subsidies to district heating companies.	55% state budget, 45% local budgets. Budget for 2002.	145
Special Fund for Development of the Energy Sector. Most of this money goes to the power sector.	10% levy on electricity industrial power sales and 2% levy on industrial heat sales.	120
Allocation for district heating projects from the Special Fund for Development of the Energy Sector.	$1.5 million in 2001 and $3.0 million in 2002 between the industrial sectors and the district heating sector. Exact split unknown, so assume $1 million for DH for illustration purposes.	1
Heat Assistance Payments	State budget. Cost $32 million 2002.	32
Natural gas - estimated annual value of the subsidy to households by amalgamating import and indigenous gas costs.	Calculated as $333 million for 2000 and 365 million for 2001.	350
Natural gas - estimated annual cost of operating	Represents a new cost for the natural gas sector	32

[67] According to 'Low-income customers - meeting their needs', ERRA, December 2000, the average household price at the end of 2000 was 5.3 c/kWh, the social tariff was 3.3 c/kWh and the standard tariff was 5.9 c/kWh. Without the cross-subsidy, the price for all households should have been 5.3 c/kWh.

the new inverted block tariff.		
Implicit subsidy - natural gas - loss from low prices (for all sectors, not just households). Source, IMF	Average of $1,249 million (2000), $1,373 million (2001), $1,001 million, (estimate, 2002) and $741 million (estimate for 2003).	1,091
Implicit subsidy - natural gas- loss from non-collection (for all sectors, not just households). Source, IMF.	Average of $74 million (2000), $189 million (2001), $107 million (estimate 2002) and $59 million (est. 2003).	107

Source: various sources as described throughout this report.